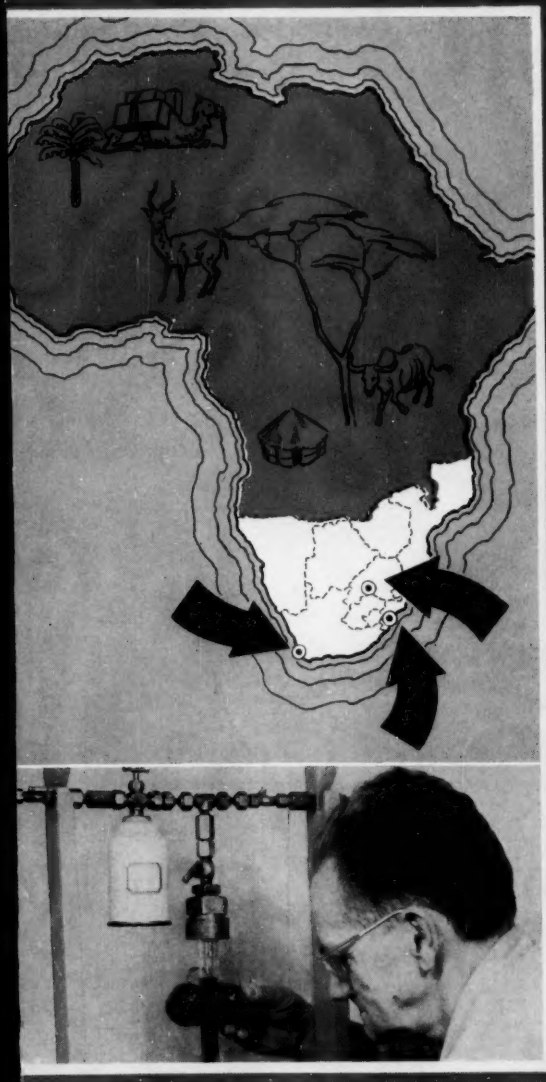
Chemical Week

June 16, 1956

Price 35 cents



Time for a look ahead: Top chemical executives gather at White Sulphur Springs for annual [illegible] meet p. 20

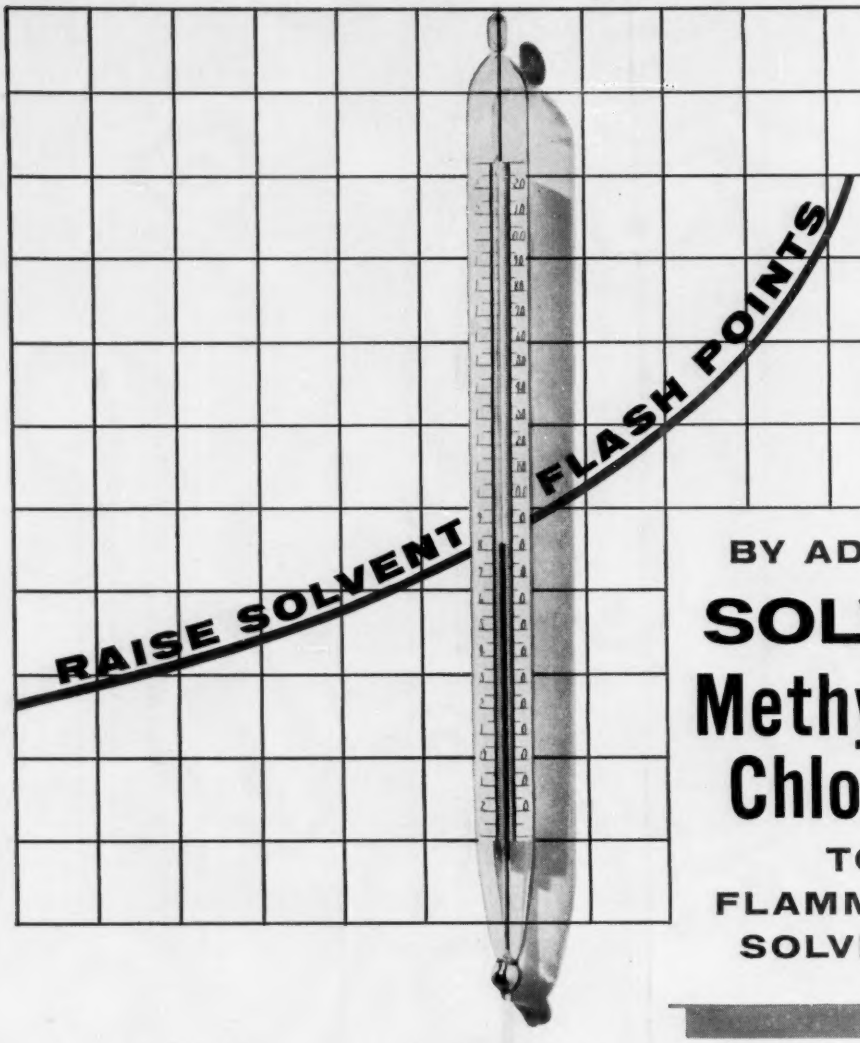
To tap South African markets, you will be smart to build a plant there . . . . . p. 36

New fibers from low cost olefins loom as the next contenders for expanding textile markets . p. 64

Polypropylene's the plastic to watch; scores of firms are applying for manufacturing licenses . p. 79

The next aerosol boom will be born in the lab; and opportunities for research are unlimited . . . p. 44

A McGRAW-HILL PUBLICATION



BY ADDING

SOLVAY Methylene Chloride

TO FLAMMABLE SOLVENTS

SOLVAY® Methylene Chloride is an economical, nonflammable solvent with low toxicity that can be used to raise the flash points of many solvents into the safety zone.

The addition of SOLVAY Methylene Chloride to many aliphatics, aromatics, alcohols, ketones, esters and other solvents having flash points below 80° C. will produce mixtures that will meet I.C.C. standards for nonflammability.

Write for helpful article "Methylene Chloride for Raising Solvent Flash Points . . . and Its Effect in 27 Solvents," a reprint from "Petroleum Processing," Nov., 1955.

SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

BRANCH SALES OFFICES:
Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse

AMERICA'S FIRST PRODUCER OF ALKALIES — SOLVAY — 75th YEAR 1881-1956

Soda Ash • Snowflake® Crystals • Chlorine
Potassium Carbonate • Calcium Chloride
Sodium Bicarbonate • Ammonium Chloride
Ammonium Bicarbonate • Caustic Potash • Chloroform
Sodium Nitrite • Caustic Soda • Methyl Chloride
Cleaning Compounds • Methylene Chloride • Monochlorobenzene
Para-dichlorobenzene • Ortho-dichlorobenzene • Hydrogen Peroxide

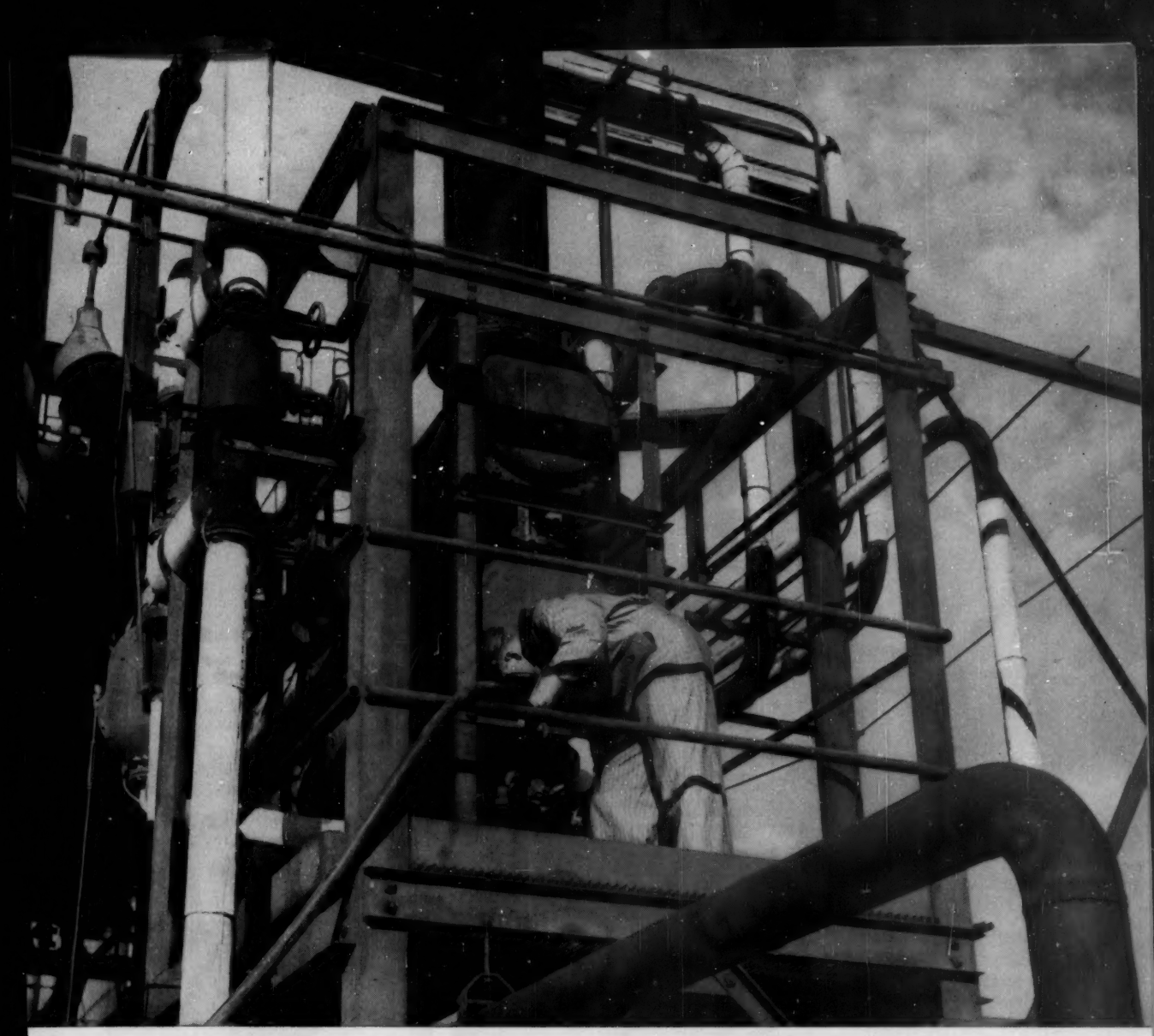
SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

Allied Chemical

Gentlemen: Please send me—AT NO COST OR OBLIGATION:

- ☐ Reprint—"Methylene Chloride for Raising Solvent Flash Points."
- ☐ Your new book on Methylene Chloride and other SOLVAY Chloromethanes.
- ☐ Additional information—see attached letter.

Name_____
Company_____
Title_____
Address_____
City_____ Zone_____ State_____ DP-6



There's too much at stake —clean it right

Chemical cleaning involves costly equipment and often work stoppages. It's a job for experts. Let Dowell protect that equipment and keep production losses to a minimum when you have scale or sludge problems.

In over 15 years our trained engineers have serviced virtually every kind of equipment in plants, mills and refineries throughout industry. In fact, Dowell has cleaned over 10,000 boilers alone!

This experience means lower costs to you—in more thorough work, restored efficiency and less production loss.

Furthermore, Dowell engineers know you value the safety of your men and equipment. Dowell uses only the latest safety equipment and techniques to eliminate hazards and accidents. Our engineers work closely with your safety personnel to establish the safest possible working procedures.

Call the nearest of more than 165 Dowell offices. An experienced engineer will be glad to talk over and help you with your cleaning problems any time — at no obligation. Or write Dowell Incorporated, Tulsa 1. Oklahoma, Dept. F-92

chemical cleaning service for industry

DOWELL

A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY

Operating plants are today proving the worth of Catalytic's ability to design for profit.

Pioneering achievements in such diversified fields as metallurgy, petroleum, chemicals, and petrochemicals are recorded in concrete and steel.

The skill, creative ability, and experience of Catalytic's personnel, alone or supplementing the engineering forces of your own organization, can create the kind of plant that will produce profits for you.

CATALYTIC

CONSTRUCTION COMPANY

PHILADELPHIA 2, PENNSYLVANIA • TOLEDO, OHIO

In Canada:
CATALYTIC CONSTRUCTION OF CANADA, LIMITED; SARNIA, ONTARIO; MONTREAL, QUEBEC

CATALYTIC *ON-TIME...*
***ON-BUDGET* SERVICES**
for the metallurgical, chemical, petrochemical and oil refining industries: Project Analysis; Process Development; Process Design; Economic Studies; Engineering; Procurement; Construction; Plant Operation

Chemical Week

TOP OF THE WEEK June 16, 1956

U. S. will cut tariffs on 104 imported chemical products, and, in return, will get tariff concessions from 17 countries ..... p. 24

Chemical unions ask use of federal wage law to hoist pay rates in the South ..... p. 39

Barrett and Cyanamid lock horns in ad scrap on melamine dishes as chinaware makers and others get set to invade the field ..... p. 57

For better separation of close-boiling liquids, Swiss add novel reflux control to wetted-wall columns .... p. 90

Chemical Week

June 16, 1956 *Vol. 78, No. 24*

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc. James H. McGraw (1860-1948), founder. Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office: 1309 Noble St., Philadelphia 23, Pa. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publication Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Circulation Director.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. Position and company connection must be indicated on subscription order. Address all subscription communications to Chemical Week Subscription Service, 330 W. 42nd St., New York 36, N.Y., or 1309 Noble St., Philadelphia 23, Pa. Allow one month for change of address.

Single copies, 35¢. Subscription rates—United States, United States Possessions and Canada, $3.00 a year; $4.00 for two years; $5.00 for three years. Other Western Hemisphere countries, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries, $25.00 a year; $40.00 for two years; $50.00 for three years.

Second class mail privileges authorized at Philadelphia, Pa.

OPINION

$$C = \frac{n!}{r!(n-r)!}$$

GENTLEMEN: In reading the recent article "How to Sell a $700-Million Market," by Harry Burrell (*CW Report, May 19*), a particular item in the block titled "Confusion Compounded" aroused my curiosity.

In the first sentence of the opening paragraph, it is mentioned that one thing that makes poker interesting is the possibility of drawing over *2.5 million* different five-card hands from a 52-card deck. This seems to me to be nothing short of fantastic, and I wonder if you might be able to enlighten me regarding this.

RICHARD H. DAVIS
South Orange, N.J.

The number of combinations, C, of n *objects taken* r *at a time is given by the formula*

$$C = \frac{n!}{r!(n-r)!}$$

In this case, n=52, r=5, and C turns out to be 2,598,960.—ED.

A Matter of Emphasis

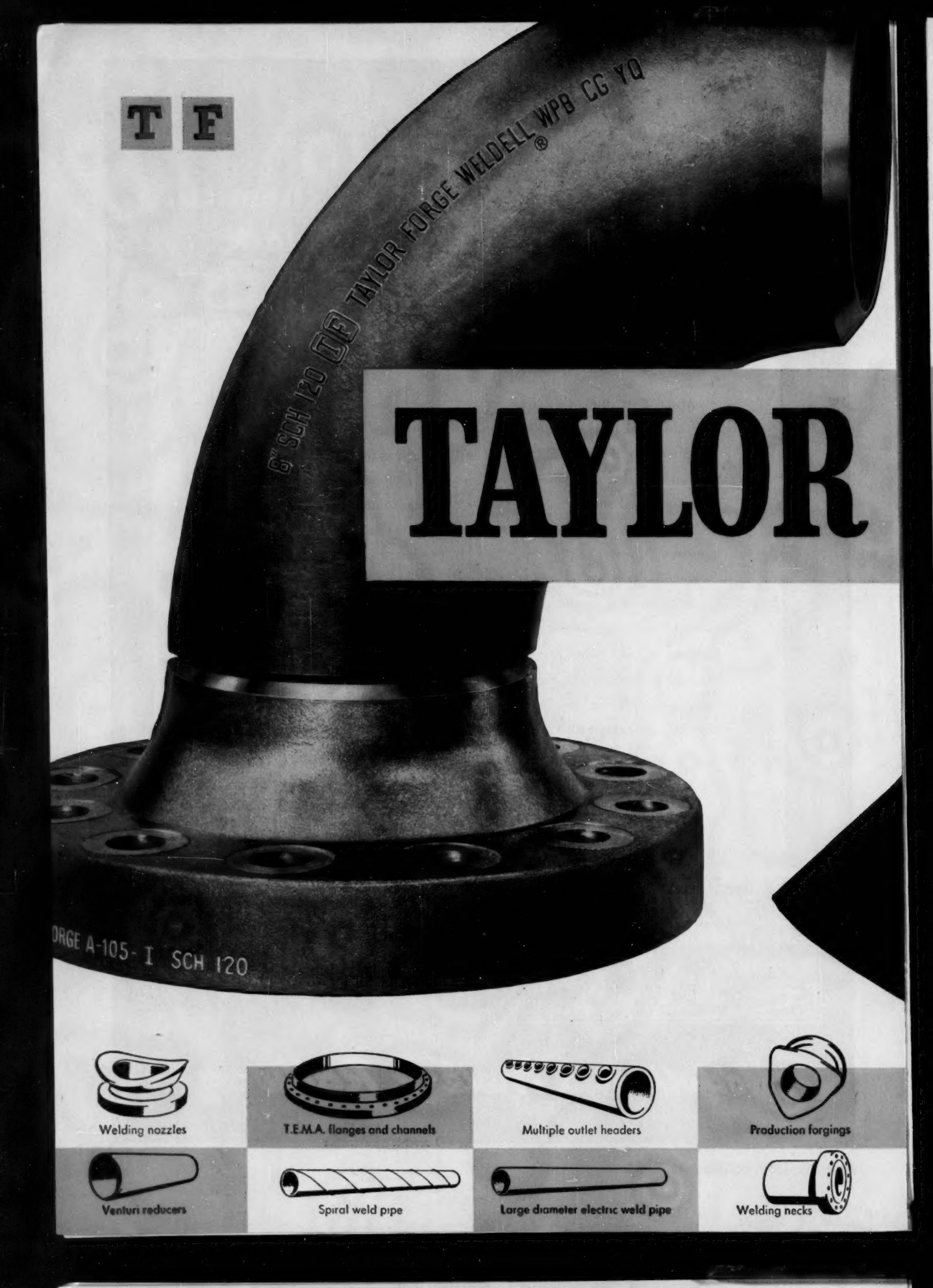
DEAR MR. JOHNSON: The *CW* report (*March 17*) titled "Coatings: How to Sell a $700-Million Market" aroused a great deal of comment among our plastics management group. In behalf of this management, I would like to point out some obviously inaccurate reporting in the author's treatment of the styrene-butadiene latex subject.

Mr. Burrell states concerning styrene-butadiene latexes: "The only real advantages that these materials have are their moderate price and their ability to be thinned with water." This is certainly not borne out by the facts.

In the paint industry, the technical advantages of styrene-butadiene latexes as latex paint vehicles are well known. It is a recognized fact in the paint

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.


T F
6" SCH 120 OD TAYLOR FORGE WELDELL WPB CG YQ
TAYLOR
ORGE A-105-I SCH 120
Welding nozzles
T.E.M.A. flanges and channels
Multiple outlet headers
Production forgings
Venturi reducers
Spiral weld pipe
Large diameter electric weld pipe
Welding necks

Here's a rugged pair ready to be teamed up for a tough job

For utmost value on any piping job insist on

FORGE Welding Fittings and Forged Flanges

* Backed by 55 years' experience
* Engineered for unvarying accuracy
* Forged for maximum strength and stamina
* Guaranteed to meet all American Codes and Standards
* Available in every size, type, thickness, pressure rating and material

To be sure... turn to Taylor Forge

... TRADITIONALLY DEPENDABLE

Taylor Forge & Pipe Works

General Offices and Works: P. O. Box 485, Chicago 90, Illinois

Plants at: Carnegie, Pa.; Gary, Ind.; Houston, Texas; Fontana, Calif.; Hamilton, Ont., Canada.

District Sales Offices: New York, Philadelphia, Pittsburgh, Atlanta, Chicago, Houston, Tulsa, Los Angeles, San Francisco, Toronto, Calgary.

PATRONIZE YOUR NEARBY TAYLOR FORGE DISTRIBUTOR

He carries a full stock of Taylor Forge Welding Fittings and Forged Flanges and can supply your needs promptly. He's a good man to know for he understands piping and through him you have available the services of Taylor Forge engineers for help and advice on any piping problem.

industry that any paint formulation represents a compromise. The consensus of the formulators responsible for the great bulk of latex paint now being sold is that styrene-butadiene latex possesses the best combination of properties of the commercially available paint latexes.

It would be quite interesting indeed if Mr. Burrell had backed up his remarks with opinions from the formulators who are responsible for styrene-butadiene latex paints on the market, including: W. P. Fuller's Ful-Color, Glidden's Spred Satin, National Chemical's Luminall, National Gypsum's Gold Bond Velvet, Pittsburgh Plate Glass' Rubberized Wallhide, Sears Roebuck's Master-Mixed, Sherwin-Williams' Super Kem-Tone, U. S. Gypsum's Texolite Duravall, to mention only a few.

Continuing to quote from Mr. Burrell's article: "These so-called water-base paints have been well accepted by the amateur interior decorator, but the field has been thoroughly exploited." In the face of this "thoroughly exploited" field, The Dow Chemical Co. is proceeding with the building of a new plant at Pittsburg, Calif., costing more than $1 million, as well as expansions at other plant sites, to take care of the expanding market for styrene-butadiene latexes.

In the paint industry, in the face of increasing competition from other suppliers of styrene-butadiene latex, as well as competition from modernized, conventional paint vehicles, plus the efforts of manufacturers of polyvinyl acetate and acrylics, our 1955 styrene-butadiene latex business showed a 20% gain over the previous year. During this same period, we registered a 63% increase in the number of customers buying in tank cars or tank trucks. . . .

NORMAN R. PETERSON
Manager, Coatings Technical Service
Plastics Dept.
The Dow Chemical Co.
Midland, Mich.

More on Nitromethane

DEAR DR. JOHNSON: We're always pleased to see someone else share our enthusiasm for the nitroparaffins. We agree with the implication of your story, "Nitroparaffins in Gasoline" (*May 12*), that the nitroparaffins may have potential in conventional auto

NOW! from the world's largest horizontal steel extrusion press...

SEAMLESS

HEAVY WALL PIPE

from any ferrous alloy

Now heavy wall pipe can be extruded from any ferrous alloy — in lengths up to 50 feet or more, with O.D.'s from 4″ to 22″, and with virtually no restriction on wall thickness.

The giant Curtiss-Wright horizontal extrusion press, now operating at the Metals Processing Division, *moves* the metal instead of *removing* it, for pipe of maximum length — and strength.

If your application calls for higher heat, corrosion and/or abrasion resistance — in pipe of highest tensile and yield strengths — Metals Processing Division is geared to fill the requirement. Complete facilities for handling any ferrous alloy, including the stainless series, as well as titanium and other reactive metals, are available to the chemical, petroleum, power and other key industries.

Take advantage of this new, aggressive facility for your pipe requirements. Write, wire or telephone for detailed information or engineering consultation today. Our field engineers are at your service.

METALS PROCESSING DIVISION
CURTISS-WRIGHT
CORPORATION • BUFFALO, NEW YORK

OPINION

fuels as well as special racing fuels, but we want to correct several technical errors that might discourage potential users.

We know of no evidence that nitroparaffin fuels are more corrosive than conventional fuels to engines and exhaust systems. Nitric acid is not liberated by thermal decomposition or combustion of the nitroparaffins. Oxides of nitrogen may be liberated, but they are also present in the exhaust gases from conventional fuels. The nitroparaffins themselves are stored and shipped in steel. The corrosion angle may have arisen because some of the racing fuel blends are corrosive to terne tanks and copper lines. Aluminum is satisfactory.

Nitromethane has sufficient gasoline solubility, about 5% in typical regular gasolines, that this should not restrict its use as an additive in conventional fuels. It does limit the amount that can be added to a gasoline-base racing fuel.

Since it has been available in quantity from Commercial Solvents Corp., nitromethane has developed large-scale use as a solvent and raw material for synthesis. While it can be detonated under special conditions, especially if sensitized by compounds like amines, it is much too stable to be classed as an explosive. It is regularly shipped in tank-car quantities like any other solvent. It requires no special handling in shipping or storage.

Commercial Solvents Corp. is sponsoring research at the Bureau of Mines to further delineate the mechanism of sensitization and desensitization. We are not working on explosives, though we do follow with interest the development of others in this field—Hercules' use of nitromethane with NH_4NO_3 (U.S. patent 2,325,064); Aerojet's use of sensitized nitromethane (Canadian patent 490,744); and Darrow and Scott's use of higher nitroparaffins with NH_4NO_3 (*Chemical Week, Dec. 10, '55, p. 73*).

These represent promising applications for the nitroparaffins, but are special compositions rather distantly related to the application of the nitroparaffins as engine fuels.

R. S. EGLY
Director, Nitroparaffin Development
Commercial Solvents Corp.
Terre Haute, Ind.

Reader Egly and we differ not on facts, but on interpretation. Dr. Frank

Wyandotte's representative talks over chlorine requirements with Vice President Robert B. Jones.

"With Wyandotte quality chlorine and prompt service we give customers product uniformity, fast delivery"

— says Robert B. Jones, vice president, John Wiley Jones Co., Caledonia, New York

"Back in 1931, when the John Wiley Jones Company started to manufacture sodium hypochlorite bleach, there was a big need for cylinder delivery of liquid chlorine," relates Robert B. Jones, vice president.

"Realizing the tremendous potential, our company took on the job of packaging chlorine and making delivery — via containers — to installations all over the world. The very nature of the business requires that we give uniform quality and fast delivery — and we can, thanks to Wyandotte's product excellence and prompt delivery.

"We have spent years in the job of controlling the taste and purity of water. Packaging chlorine in convenient, safe containers, we've been responsible for the health protection of millions of people in the U.S. and 23 foreign countries . . . some as far away as Arabia, Iran, and Venezuela.

"In order to give good service to these countries, we have to work very closely with our suppliers. For the past 25 years, Wyandotte has filled our needs for chlorine, and we have often called upon them for research and technical assistance."

Are you looking for a source of supply to meet your own chemical needs? If you are, investigate Wyandotte's services, technical assistance, and high-quality chemicals. Call in a Wyandotte representative today, and let him show you how you can benefit from dealing with Wyandotte — a leading supplier of quality chemicals for over 65 years. Or write: *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

Wyandotte
CHEMICALS

MICHIGAN ALKALI DIVISION
HEADQUARTERS FOR ALKALIES

P.S. Our fact-packed new book on Wyandotte Chlorine describes uses, properties, chemical reactions, unloading, safety precautions. 96 pages, 50 illustrations, 20 tables, charts, diagrams. Indexed. Supply limited. Write on company letterhead for your copy.

OPINION

E. Dolian, manager, market development department, Petrochemicals Division, Commercial Solvents Corp., said in a paper presented before the Division of Chemical Marketing and Economics at the Dallas, Tex., ACS meeting last April 9: "Neither nitromethane nor methanol is miscible with conventional gasoline fuels, but by use of benzol as a blending agent, sizable amounts of nitromethane or methanol or both can be added to gasoline." And, "For the same reasons that make it of interest as a monopropellent, nitromethane is also a very promising explosive component. . . . The fact that nitromethane has explosive properties under certain conditions is a mixed blessing to CSC, since that fact has been a powerful psychological barrier to the development of many large-volume industrial applications . . . [but] one of the things that make nitromethane of so much interest as an explosive component is the fact that it is so safe and can be shipped, handled and stored as a chemical instead of as an explosive."—ED.

SEE YOU THERE

American Rocket Society—American Society of Mechanical Engineers, semi-annual meeting, sessions on liquid rockets, solid rockets, ramjets, Hotel Statler, Cleveland, June 17-21.

Second International Conference on Plant Protection, Fernhurst, Sussex, England, June 18-21.

Stanford Research Institute and **University of California,** a symposium on high temperature, campus, Berkeley, Calif., June 25-27.

American Institute of Electrical Engineers, general meeting, Hotel Fairmont, New York (chemical sessions June 28), June 25-29.

Society of the Chemical Industry, 75th annual meeting, London, July 9-14.

Virginia Polytechnic Institute, 9th Oak Ridge Regional Symposium, Blacksburg, Va., July 30-31.

National Soybean Processors Assn. and American Soybean Assn., annual meeting, University of Illinois, Urbana, Aug. 13-15.

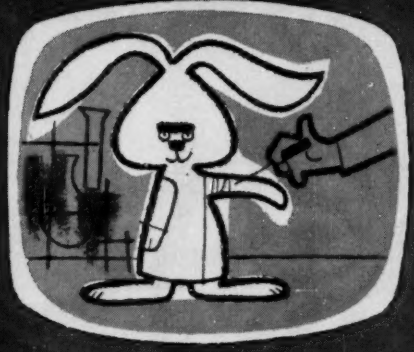
American Institute of Chemical Engineers, meeting, William Penn Hotel, Pittsburgh, Sept. 9-12.

Internation Congress on Catalysis, meeting, Bellevue-Stratford Hotel, Philadelphia, Sept. 10-14.

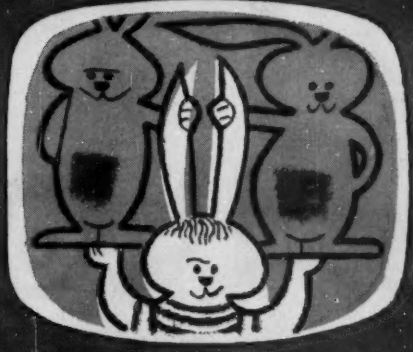
a Pfizer TV story about multiplying markets*

* This TV stands for the Tremendous Versatility of Pfizer Chemicals

Tune in here. We think you'll be surprised at all the places you find Pfizer chemicals. Here are some denizens of Pfizerland to help us tell you about them. First...

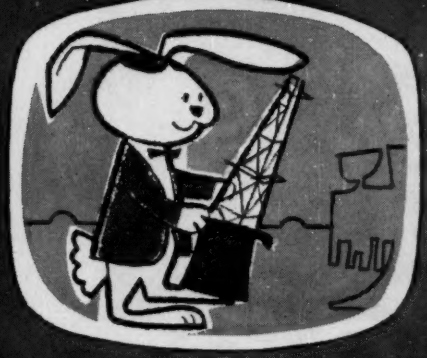


MEET RICHARD the research rabbit. He took part in recent toxicity tests that proved the safety of Pfizer Gluconates (mineral carriers in vitamin products). These gluconates increase sales because of better tolerance and absorption. Next...



HERE'S RICHARD, JR. dramatizing the strong position of Pfizer bulk vitamins... used in the pharmaceutical industry and to vitamin-enrich foods and beverages. Now to portray another Pfizer role in food sales, we find...

MRS. RABBIT buying foods safely wrapped in vinyl plastics made with non-toxic Citroflex® A-4 plasticizer. Good for making films, bottle crown liners, coatings for packaging both fatty and non-fatty foods...And here's...



A MAGICIAN'S APPRENTICE pulling out of the hat another example of Pfizer performance...an oil well producing at increased volume when citric acid prevents "plugging" during secondary recovery...You too can multiply markets...

PFIZER IN YOUR PRODUCTS WORKS WONDERS IN YOUR SALES

These are but some of the bulk products of the Pfizer Chemical Sales Division used in over 150 different industries:

• Citric, Tartaric, Oxalic Acids and Salts • Ascorbic Acid • Caffeine • Itaconic Acid • Vitamins • Antibiotics • Hydrocortisone • Reserpine • Plasticizers

Manufacturing Chemists

Pfizer

for Over 100 Years

For further information contact:

CHAS. PFIZER & CO., INC.

Chemical Sales Division

630 Flushing Ave., Brooklyn 6, N. Y.

Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas

it's not just the AMMONIA

...it's what goes with it!

You get more than just ammonia when you order from Allied. You get:

ASSURED SUPPLY. Allied has 3 plants — at Hopewell, Va., South Point, Ohio and Omaha, Nebraska — all producing to the extremely high standards originally set for industry by Allied.

FAST DELIVERY — even on short notice. Each plant is located on water, key rail lines and highways in the heart of the heaviest consuming areas.

FINEST TECHNICAL SERVICE. Allied has an accumulation of ammonia know-how unequalled in the industry! Its technical service group can bring you the benefit of many years experience gained from participation in all types of production and research programs.

Do you have an ammonia problem — service, delivery, research? Write or phone us today.

Dept. AA1-7-1

Allied Chemical — NITROGEN DIVISION

40 Rector Street, New York 6, N. Y.

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate—85% Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Sodium Nitrate • Methanol • Nitrogen Tetroxide • Nitrogen Solutions • Fertilizers & Feed Supplements

Business
Newsletter

CHEMICAL WEEK
June 16, 1956

The chemical industry targets for the AFL-CIO's first organizing drive have been singled out by the federation's two chemical unions—the Oil, Chemical and Atomic Workers (formerly CIO) and the Chemical Workers Union (ex-AFL). They've drawn up a list of 22 specific chemical plants, which together employ about 10,000 workers, as their target. This agreement is the first such one made between former rival unions now amalgamated within the AFL-CIO. And it clears the way for the federation to place members of its 300-man organizing staff at the call of both chemical unions.

Which firms will be hit by the organizers? Union men, of course, aren't saying. But the plants are spread across the country and not concentrated in any single geographic location. They are plants, operated by smaller companies, that neither union has seriously tried to organize up to now, but which have been nominated by union field organizers as ones where unionizing efforts would stand a fairly good chance.

Such large concerns as Du Pont, Allied and Dow won't be affected yet. The leaders of the two unions have been unable to agree on which one is to organize which large company—though they've agreed that only one union should organize each multi-plant company. (As OCAW's "Jack" Knight puts it: "Take Du Pont, which could be a wage pace-setter. It's better to have one union doing the bargaining throughout the company.")

There's no target date for the 22-plant drive, but since the AFL-CIO organizing staff has been given clearance to help present chemical organizers, it could start any week. Adds union president Knight. "We're ready to go."

•

That Niagara rock slide last week had little effect on chemicals. Though loss to the Niagara Mohawk Power Corp. will total more than $100 million, there were only minor interruptions to chemical production.

A Hooker Electrochemical spokesman reported "a power surge"; National Carbon "came through nicely—the interconnecting power service was so thorough that it caused hardly a flicker." The effect on Olin Mathieson operations was "very minor." Carbide and Carbon reported a 25-minute interruption.

•

Du Pont, in a 4-3 Supreme Court decision, this week won its case as the court dismissed the government's cellophane monopoly charges. The court upheld Du Pont's argument that cellophane is interchangeable with other wrapping materials, is only a part of the entire flexible packaging materials market. The government, in 1947, charged that Du Pont's production of 75% of U.S. cellophane had monopolized the market.

Wrote Justice Stanley Reed: "It seems to us that Du Pont should not be found to monopolize cellophane when that product has the competition and interchangeability with other wrapping that this record shows."

Dissenting, Chief Justice Warren said he is convinced cellophane was not in effective competition with such products as glassine and wax paper; the ruling "virtually emasculates" a main provision of U.S. antitrust laws.

Business Newsletter

(Continued)

Another bruited expansion—of U. S. tetraethyl lead capacity—is making news this week. Ethyl Corp. may build a TEL plant at Lockport, Ill., where it is going ahead with vinyl chloride production, or at a West Coast location —reputedly adjacent to the Antioch, Calif., site on which Du Pont is building a similar plant. Ethyl declines to confirm or deny either report.

A prospective TEL producer, however, has not only dropped its plans, but has sued its one-time consultant for $200,000. The company: Stepan Chemical (Chicago); the consultant: George Schlaudecker, president of Maumee Chemical (Toledo). Stepan, in a suit filed in federal court in Toledo, says that in 1954 it entered into an agreement with Schlaudecker under which he would advise it on construction and design of a plant using a TEL process owned by Germany's Friedrich Uhde Co. Stepan alleges that plant design had not commenced as specified in the contract; as a result, its agreement with Schlaudecker is not in effect. Stepan wants Schlaudecker enjoined from making further efforts to collect fees, and asks damages.

Schlaudecker, however, says that he completed the technical work required of him in the contract, and last January asked Stepan if it would submit the matter to arbitration to avoid the embarrassment of a public suit. Stepan, he reports, requested further time. When he told the company in May that he planned to go to court, Schlaudecker says he was asked for, and gave, another week—during which the suit was filed against him.

•

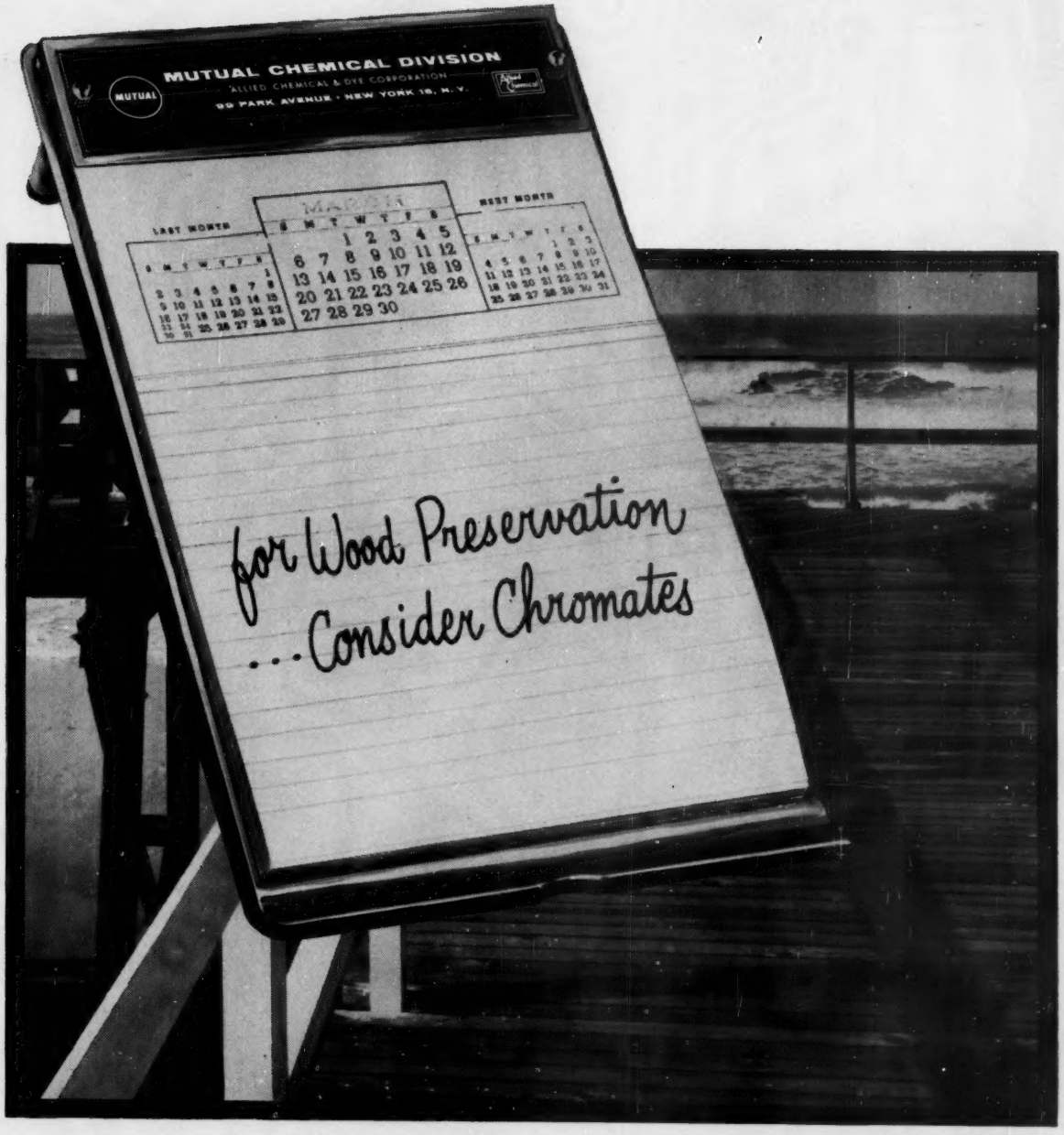
The plastics molding firm that put up its own styrene monomer plant, Foster Grant Co., is going deeper into chemicals. It plans a million-dollar plant at Leominster, Mass., to manufacture "an improved nylon-6" plastic from caprolactam. It thus will be the third nylon plastic producer in the United States —though, unlike the others, it will buy its raw materials. National Aniline produces a caprolactam polymer; Du Pont makes nylon-610, a copolymer with similar properties.

The plant, with a capacity of "two million plus" lbs./yr., is scheduled to go onstream in the spring of 1957. It will be financed out of retained earnings —but the company is definitely thinking about a public stock offering.

•

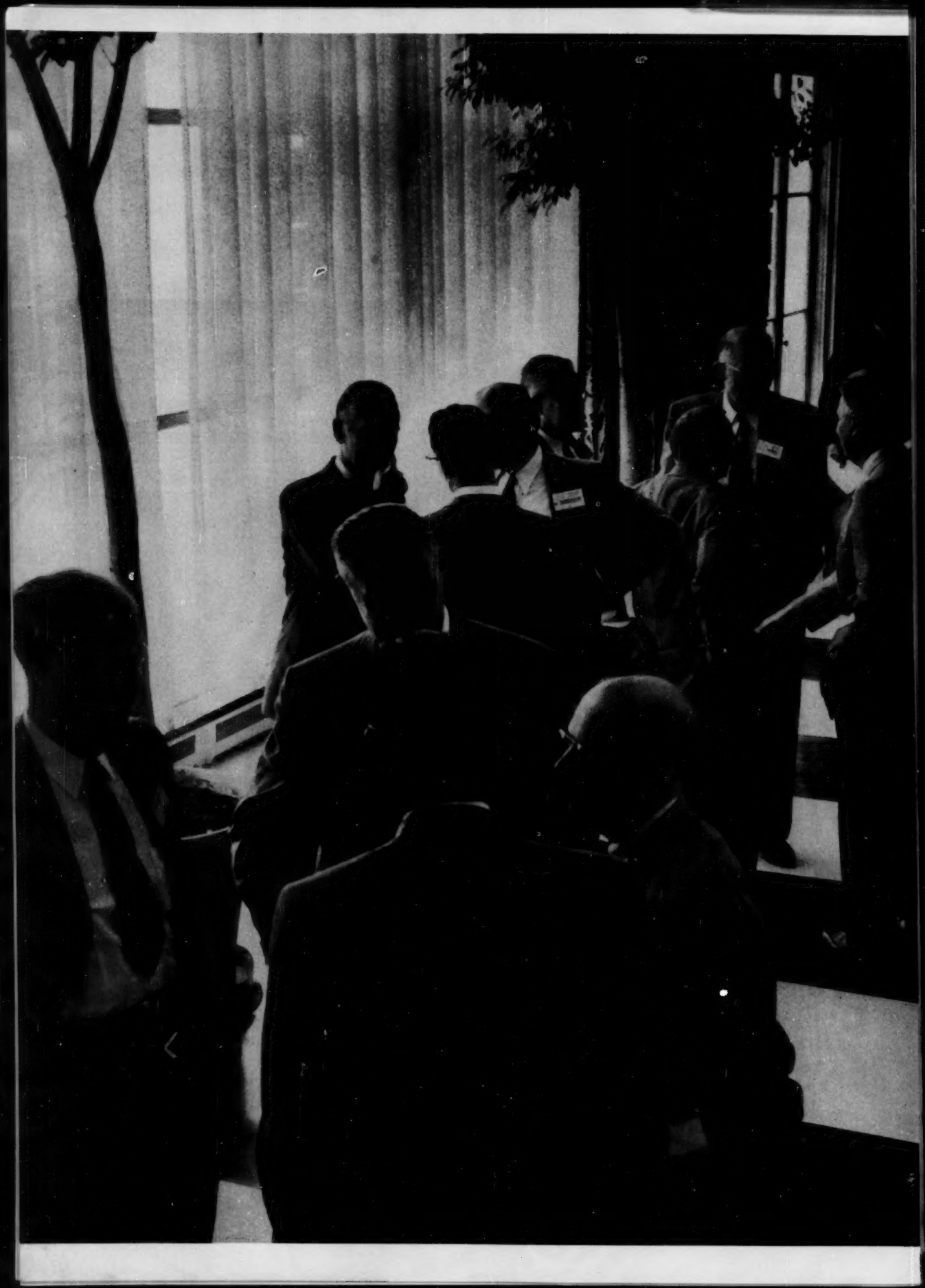
That increase in the Louisiana sulfur extraction tax proposed by Governor Earl K. Long has gotten the approval of the House Ways and Means Committee—thus passing the first of a long series of hurdles. The proposed state constitutional amendment, tripling the tax from $1.03 to $3/ton, would chiefly affect Freeport Sulphur—which mines 95% of the total Louisiana production.

Freeport, meanwhile, plans an active search for Mexican sulfur. The company's executive vice-president, Robert C. Hills, indicated that Mexican sulfur reserves may be necessary for the company's future development. "Imposition of this $3 tax," he reports, "will make it difficult, if not impossible, to develop Louisiana's deposits."



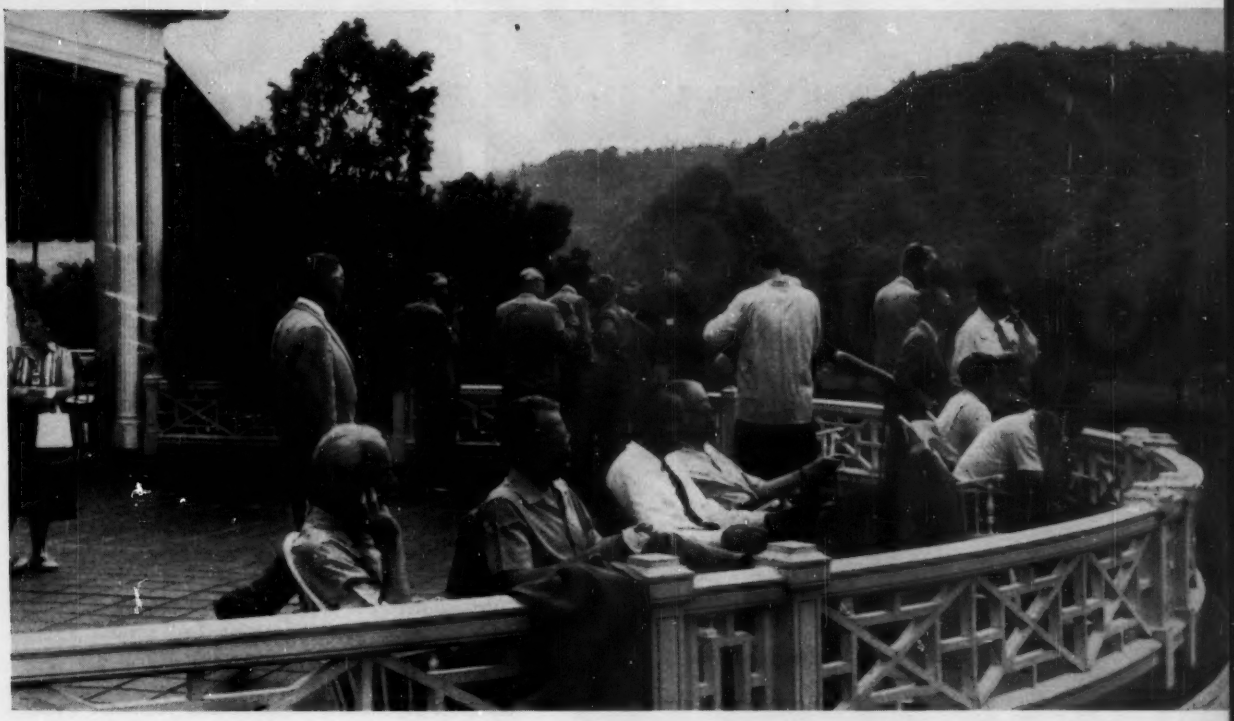
The demand for lumber treated with Chromate salt formulations is increasing due to the ability of these preservatives to provide a long, useful life for wooden structures. In addition to making lumber resistant to fire, fungi and termites, these effective chromate compounds give the wood clean, odorless, paintable surfaces. Mutual does not make these formulations, but is a leading manufacturer of the Chromium Chemicals called for in government and industry specifications for water-borne preservatives.

SODIUM BICHROMATE • POTASSIUM BICHROMATE • SODIUM CHROMATE • CHROMIC ACID



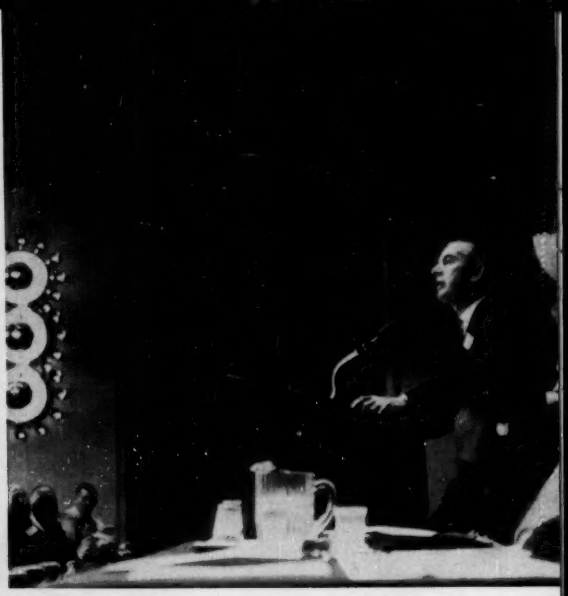
Chemical Week

June 16, 1956



Top Management Meets on a Mountain for a Long Look Ahead

THE MEN WHO RUN the U. S. Chemical industry sought new perspective last weekend as they worked and relaxed at West Virginia's Greenbrier.



"Any venture which tried too hard to avoid all the low spots would never climb very high into the hills."

They Pondered . . . And Played Together, But . . .

AS THE TOP-ECHELON men of the Manufacturing Chemists' Assn. met at White Sulphur Springs, the fundamental anatomy of most management conferences showed through clearly. Like the Greenbrier itself, the meeting had several levels. There was the formal program, highlighted by Du Pont's Greenewalt (*above*) who cautioned against a too-great dependence on short-term economic trends as indicators of the chemical industry's well-being.

There was a sports stratum—of skeet and swimming, of golf and tennis.

But the private discussions proved the key to the meeting—by an overflow of confidence in the industry's future. While there was sarcasm ("Your next year's contract got me here, but I still have to pay my way back"), it was the give and take in president-to-president talk ("Sure, we're looking into polypropylene markets; isn't everybody?") that will likely mean the difference for the chemical industry between mere growth and substantial prosperity.

IN SPORT: Rohm & Haas' Don Frederick tees off as Du Pont's Crawford Greenewalt and Bower's Syd Thayer take to the tennis court.

IN CONGRATULATION: Goodrich-Gulf's Bill Burt congratulates Monsanto's John Gillis on his election as MCA's new board chairman. In center, Gillis' colleague, Frank Curtis.

IN INTRODUCTION: At a Cyanamid-sponsored get-together, President Kenneth Towe meets a company guest.

Their Private Talks Will Chart the Future

IN CONVERSATION: Victor Chemical President Rothe Weigel emphasizes an important point to Atlas Powder's Bill Wiley (left).

U.S. Chemical Trade: New Tariffs Coming

THESE ITEMS WERE CUT

BY THE U. S.

Vinyl acetate, polymers
Miscellaneous inorganics
Organic solvents
Saccharine
Vanillin
Phthalic anhydride
Phenol
Caffeine
Theobromine
Diethyl barbituric acid, salts
Cellulosic plastics
Tanning extracts
Germanium dioxide
Pentaerythritol
Guanidine nitrate
Thiourea
Cyanuric chloride

BY OTHERS

Alkyd resins
Silicone resins
Vinyl resins
Fluorinated ethylene polymers
Methacrylate resins
Synthetic fibers, fabrics
Insecticides
Streptomycin
Wide-spectrum antibiotics
Paints, varnishes, lacquers
Adhesives
Turpentine
Rosin
Cosmetics
Soap

22-Nation Negotiations Bring Substantial Concessions

U.S. tariffs on 104 imported chemical commodities will be cut on June 30 as a result of the recently concluded tariff negotiations at Geneva. Concessions were made by 22 member nations of the General Agreement on Tariffs and Trade (GATT).

Detailed results of the conference published last week include these changes in chemical tariffs:

• The U.S. won direct tariff concessions from countries on chemical products, exports of which were worth more than $25 million in 1954. In addition, U.S. exporters of chemicals will benefit indirectly from a large number of concessions negotiated among the other participating countries, which are automatically extended to the U.S. under GATT's "most favored nation" rule.

• Reciprocal U.S. concessions were made on some chemical imports. These, valued at about $40.8 million in 1954, represent 4.3% of all U.S. dutiable chemical imports.

• While the monetary value of trade covered by U.S. concessions was larger than the value of foreign concessions to us, it was more than compensated, according to U.S. officials, by deeper average cuts in foreign rates than in U.S. rates. U.S. duty cuts have already been limited by law to a maximum of 15%, spread over three years, and further limited in many cases by the Tariff Commission's "peril points"—below which duties can't be cut without threatening injury to domestic industry. These peril points were rigidly adhered to by U.S. negotiators at Geneva.

Of the 104 chemical categories for which U.S. tariff rates will be reduced, imports were over $1 million in 1954 in only eight categories; over $2 million in only two and over $10 million in just one. The most important concessions were these groups:

(1) A miscellaneous category of organic and inorganic chemical elements, compounds, mixtures and salts. Most important, tradewise: germanium dioxide, nickel chloride, nickel sulfate, chrome bead catalyst, tantalum oxide, pentaerythritol, guanidine nitrate, thiourea, and cyanuric chloride.

Duties on these will be cut to 10.5% from 12.5% over the next three years. Of a total importation of $11.6 million worth of these commodities in 1954, over half ($6.4 million) came from Canada. Domestic production and exports of these products are together larger than imports.

(2) Vinyl acetate, polymerized or unpolymerized; synthetic resins made chiefly of vinyl acetate; vinyl alcohol, vinyl chloride acetate, and other vinyl derivatives—except N-vinyl-2-pyrrolidone and polyvinylpyrrolidone. Total imports of this group of noncoal-tar synthetic resins and intermediates were valued at $8.0 million in 1954 and $6.6 million in '55. Canada supplied over half of these imports in both years, with Italy, Germany, the United Kingdom and the Benelux countries supplying the rest. Domestic production of vinyl acetate, polymerized or unpolymerized, and synthetic resins made chiefly of vinyl acetate was valued at $17.3 million in 1954, and production of all vinyl and vinyl copolymer resins was valued at $214.7 million.

On the export side, the most important concessions won by the U.S. were obtained from Germany, Japan, Sweden and the United Kingdom. Here are the highspots of these concessions:

Germany: On chemical products covered, trade was valued at $4.3 million in 1954. The more important concessions were for plastics, antibiotics and synthetic organic chemicals. Plastic materials for which duties were cut include thermosetting resins, both alkyd and silicone, and thermoplastic resins such as fluorinated ethylene polymers, polystyrene, polyvinylidine chloride, and coumarone-indene and methacrylate resins. Duties also were reduced on silicones and phosphoric ester plasticizers. Among the synthetic organic chemicals on which concessions were granted: aliphatic alcohols, propyl and butyl alcohols, some hexahydric alcohols, and certain polybasic acids. Streptomycin, Aureomycin, Terramycin, and tetracycline were the antibiotics for which duties were cut.

Japan: Concessions were granted on

11 chemical items, of which Japan bought nearly $5 million worth from the U.S. in 1954. Japan said it would not increase above the current 20% its tariffs on polystyrene, polyethylene, methylmethacrylic resins, ethylene glycol. The tariff was cut to 20% from 22.5% for synthetic resins of the vinyl chloride and vinyl acetate series in powder, lump, flake or block forms and to 20% from 30% on other primary forms of these products. The tariff was cut to 15% from 30% on detergent alkylate.

Last Big Round: The negotiations just concluded at Geneva will be the last big round of multilateral tariff-cutting under GATT for an indefinite period. No more tariff conferences will be held, at least until after the present U.S. Trade Agreements Act expires in 1958.

The focus of trade liberalization within GATT will now shift from tariffs to reducing other barriers to trade such as Balance-of-Payments quotas, regional preferences, discriminatory taxation, export subsidies.

EXPANSION

Cuprous Chloride: Henry Bower Mfg. Co. has awarded a contract to Brown, Blauvelt and Leonard Consulting Engineers to build a high-purity cuprous chloride plant in Philadelphia.

•

Pulp and Paper: Saskatchewan's first pulp mill will be built by newly formed Waskasieu Forest Products, Ltd., near Prince Albert. It will produce about 600 tons/day of bleached sulfate pulp, will cost $55 million.

•

Polyethylene: Du Pont will double its capacity for making Alathon polyethylene resin. Expansion will include modernization of existing facilities at Orange, Tex., and construction of a new unit there.

•

Silicon Carbide: Carborundum Corp. will boost its silicon carbide capacity 16% with a $300,000 expansion of its Vancouver, Wash., plant.

•

Butadiene: Odessa Butadiene Co., Odessa, Tex., will build a 50,000-tons/year butadiene plant scheduled for completion in the summer of 1957. Facilities will include a Houdry dehydrogenation section and an Esso C.A.A. purification unit. Reported cost: $16 million.

•

Carbon/Graphite: Great Lakes Carbon Corp. will boost by 45% its production capacity of carbon and graphite electrodes, anodes, mold stock and graphite specialties. Expansion will be at Morganton, N.C., and Niagara Falls, N.Y.

•

Ferromanganese: Tennessee Products & Chemical Corp. will start production of ferromanganese at its new $2.5 million Rockwood, Tenn., plant about Jan. 1, '57. Meanwhile, the company will discontinue (by July 1, '56) its ferromanganese production at two plants in South Chattanooga.

•

Lacquers/Sealers: Wolverine Finishes Corp. will build a unit near Morganton, N.C., to manufacture lacquers and sealers. Completion is set for September; cost: $100,000.

•

Synthetic Detergents/Dyeing Aids: Emkay Chemical Co. will erect a plant to make synthetic detergents, scouring agents and dyeing assistants at Charlotte, N.C.

•

Uranium: Union Carbide Nuclear is planning to build a multimillion-dollar uranium processing mill near Rifle, Colo.

•

Phenol: B. A.-Shawinigan, Ltd., is planning to expand by 50% its phenol producing unit in Montreal East, Quebec. Work on the project has already begun, is expected to be complete by early '57.

COMPANIES

Nuclear Corp of America, Inc., has purchased Isotope Specialties Co. (Burbank, Calif.) in exchange for 47,991 shares of Nuclear's Class A stock.

•

Directors of Union Bag & Paper Corp. and Camp Mfg. Co. have approved a plan to merge the two companies, subject to stockholders' approval. Camp shareholders would receive 1.75 shares of Union Bag for each Camp share held.

•

Albemarle Paper Co. will recapitalize its preferred stock for expansion purposes by reclassifying its outstand-

The Longest Yet

SMALL WONDER these days that makers of metal pipe are getting into the plastic pipe business.

Makers of the plastic tubes are showing that their products are competitive in many fields.

And now, a new length record has apparently been set, as a 98-mile network of U.S. Rubber's Kralastic has been laid. The pipe will carry the natural gas used to power irrigation pumps used in drought-riddled western Texas.

Owners of the line are the farmer members of the Swisher-Castro Counties Farmer Co-op Society, who irrigate their cotton, wheat and sorghum crops.

The line has several branches that range up to 15 miles in length, and was laid in 31 working days.

U.S. Rubber's material, a styrene-butadiene-acrylonitrile polymer, is not, of course, the only plastic finding volume piping use. Rigid butyrate piping, which got a major push in use after World War II, and polyethylene are the current leaders on a volume basis.

Washington Angles »

» **New head of BDSA's chemical division** will be Diamond Alkali's U. T. Greene. He's now coordinator of Diamond's commercial development department, and has been a production man with the company since '42.

Greene will go to Washington in July for a six-month term as division chief.

» **Greene will have at least one happy legacy** in his new post. Contrary to reports now making the rounds, the budget for the industry divisions of BDSA won't be pared by legislators. Congress is still fighting over the fiscal 1957 budget, but the disputed funds are for expanding other programs—area development, a construction survey and The National Inventors Council. So, there will be no contraction in BDSA's 850-member staff.

» **There will be a showdown in Congress** on Union Carbide's bid to purchase the government alcohol-butadiene plant at Louisville. Publicker, outbid for the plant, got Representative Hébert (D., La.) to introduce a veto resolution—and the law requires a committee vote by June 16. Chairman Fulbright (D., Ark.) of the Senate Banking Committee, moreover, will ask the Comptroller General if the sale violates the law, in view of the Justice Dept.'s refusal to okay Carbide as the buyer.

Bets have favored a veto, followed by an extension of Publicker's present 3-year lease at a rental matching Carbide's $3,125,000 purchase offer.

» **Washington will be the next state** to get federal help to survey its air pollution problem. A project for joint state-federal study there is being drawn up by the U. S. Public Health Service. It will be similar to a statewide survey now under way in Connecticut, where USPHS is contributing trained personnel.

» **In other areas, pockets are jangling** as Congress loosens purse strings. Though final approvals are still a week away, here's what Congress's unexpected generosity means:

- Food & Drug Administration—Already approved is a 15% increase in budget over this year's $5,784,000.
- National Institutes of Health—Approval last week by the Senate of a whopping $184,400,000 budget, a $58-million hike over 1956.
- National Science Foundation—Senate approval of the Administration's $41-million request. If the House goes along, NSF will have more than double its 1956 budget of $16 million.
- National Bureau of Standards—Agreement by both chambers on an $8,750,000 appropriation, up $1,337,000 from 1956, but still $275,000 off the Administration's request.

---

ing 6% cumulative preferred and second preferred into 100,000 authorized shares of a new class of cumulative preferred stock.

•

Permacel Tape Corp., a subsidiary of Johnson & Johnson, has purchased the assets of LePage's Inc., adhesives manufacturer.

•

American-Marietta Co. directors will propose a 5-for-4 split in common stock, at a meeting on June 19. At present, A-M has 2,555,698 shares outstanding, with 6 million authorized. (Approval of the directors is sufficient to effect the split.)

•

Incorporations: Whirlpool Chemical Co., Inc. (Tonawanda, N.Y.), with capital stock of $25,000; Bray Oil Co. Inc. (Comstock, N.Y.), with capital stock of $100,000.

•

Merger plans have been announced by Hazel-Atlas Glass Co. and Continental Can Co. Under the present plan, Hazel-Atlas would receive 999,141 shares of Continental stock for all 2,172,045 Hazel-Atlas shares now outstanding.

•

Salem-Brosius Inc. (Carnegie, Pa.) has acquired Metal Chlorides Corp. (Middleport, Pa.) through an exchange of stock.

FOREIGN

Synthetic Fiber/Cuba: Industrial Plants Corp. (Zurich, Switzerland) and Acetifil S.A. (Havana) will build a jointly owned acetate fiber and yarn plant in Cuba. Scheduled to be producing by late '57, the unit will turn out 6 million lbs./year of acetate yarn and staple. Von Kohern International Co. (New York) will engineer the project.

•

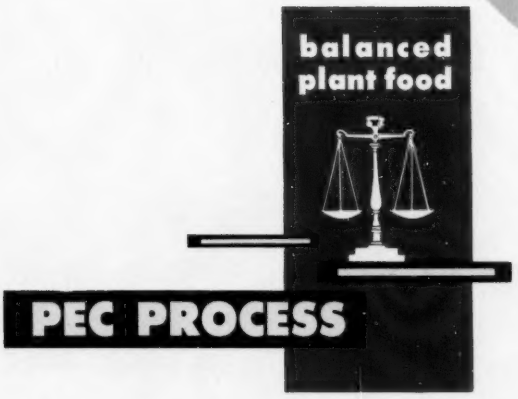
Drugs/India: The Indian Pharmaceutical Assn. has asked the Indian government to relax several legislative restraints said to have discouraged established foreign drug houses from building new plants in that country. According to the association president, Homi Nanji, India needs the know-how that foreign companies would bring along with them. Among the conditions he outlined for obtaining foreign assistance: permitting international drug houses to send out more trained technical personnel, and allowing duty-free import of necessary chemicals so that production can be economic. (A 30-40% import duty is charged today on many essential intermediates.)

•

Phosphates/Jordan: The arrival of 200 new railway wagons from Belgium will enable the Jordan Phosphates Co. to double its phosphate rock output this year. Present production target: 300,000 tons annually. Transport difficulty has been the major reason for limited output in the past; there are 16 million tons of extractable phosphates at the Russeifah mines and 14 million tons at el-Hassa. Observers predict that Jordan's phosphate production will ultimately reach 2 million tons/year.

complex fertilizer

C & I



Nitric Acid
Phosphoric Acid
Ammonium Nitrate-Stengel Granular
Ammonium Nitrate-Stengel Spherical
Ammonium Nitrate-Prilled
Complex Fertilizer
Ammonium Phosphate

THE CHEMICAL AND INDUSTRIAL CORP.

CINCINNATI 26, OHIO

Designers and Builders of Plants for the Processing of Ammonia. Available Throughout the World

new source of high quality lime
...quicklime and hydrate

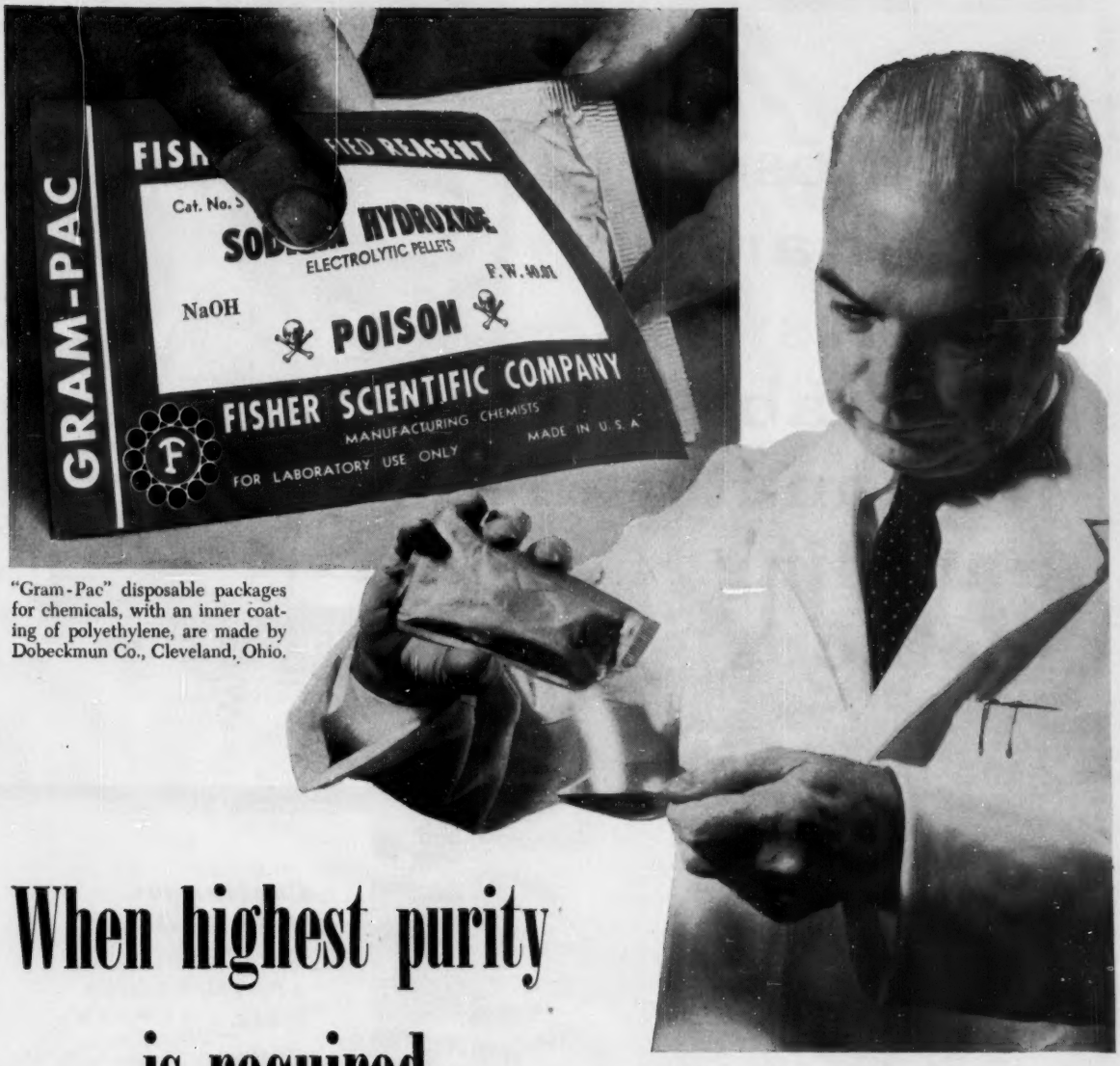
West End, supplier of quality chemicals for over 31 years, proudly announces expansion of its hydrate and quicklime production. Discovery of an extensive deposit of high grade limerock resulted in the construction of a large new processing plant. The photo shown here is of the giant 340 foot rotary kiln. The plant will soon be producing increased quantities of highest quality lime to serve the needs of growing western industry. We suggest you give consideration to West End as a primary source of supply. Inquiries and your specifications are invited.

WEST END

West End Chemical Company

SODA ASH • BORAX • SODIUM SULFATE • SALT CAKE • HYDRATED LIME

EXECUTIVE OFFICES, 1956 WEBSTER, OAKLAND 12, CALIFORNIA • PLANT, WESTEND, CALIFORNIA



"Gram-Pac" disposable packages for chemicals, with an inner coating of polyethylene, are made by Dobeckmun Co., Cleveland, Ohio.

When highest purity is required

It pays to package in film made of

BAKELITE BRAND Polyethylene Plastic

A coating of BAKELITE Brand Polyethylene Resin forms the inner lining of three-layer "Gram-Pac" envelopes developed by Fisher Scientific Company, Pittsburgh 19, Pa.

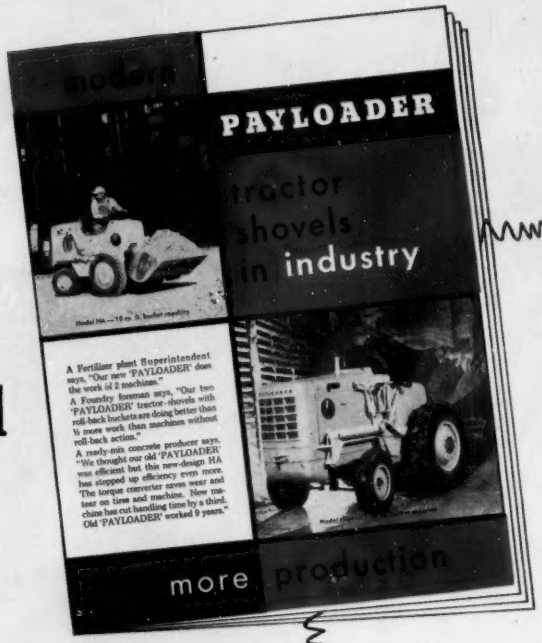
"The contents are reagents," they explain, "so pure they can be used for research and analytical work. Any contamination would be serious. Hence, inert polyethylene is used as the layer closest to the reagent."

From tiny packages like these to large drums, linings of polyethylene are serving many profitable purposes, and at desirable savings as well.

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

get these first-hand reports of profitable bulk-material handling methods



Continuous, Trouble-Free Service at APOTHECARIES HALL COMPANY

Apothecaries Hall Company is one of the oldest joint stock companies in Connecticut and have been in the fertilizer business more than 100 years. They have been "PAY-LOADER" users since 1942 and now use three model HA's and one larger model HAH. They say, " 'PAYLOADER' units are built for continuous trouble-free service and that's just what we get. The new model HA roll-back bucket increases the delivery load. This is especially true in rail car unloading."

10 Years Satisfactory experience with 10 "PAYLOADER" units at VALIANT FERTILIZER COMPANY

"Our new HA 'PAYLOADER' does the work of 2 machines." Ernest Dickerson, plant supt. of Valiant Fertilizer company, also adds, "This increase is made possible by the roll-back bucket design which carries more bulk material. The low-carrying bucket offers better vision and safety. Torque converter and bucket design gives longer tire wear, less spillage and practically no floor clean-up.

More than 35 years of experience in tractor-shovel design and application has been built into "PAYLOADER" units by The Frank G. Hough Co., originators of the unit-design tractor-shovel. It is this vast experience and knowledge incorporated into the design of each "PAYLOADER" model that makes the big difference in its superior performance on any job.

The new "PAYLOADER" Models HA and HAH include many exclusive features which pay off in greater output per hour. They are small and compact for easy maneuvering and handling in close quarters, yet have ample dumping height for most any job. The 40° bucket roll-back gets full loads fast and, combined with the hydraulic shock absorber, enables the "PAYLOADER" to carry full loads in a higher gear without spillage. These two features are BIG reasons why these machines give more production than heavier machines with bigger engines.

The full-reversing transmission and torque converter provide a wide range of easily obtainable speeds and maximum efficiency in handling each load. Extremely rugged construction . . . finest quality in each component—assures continuous performance with a minimum of "down-time" and a longer useful life.

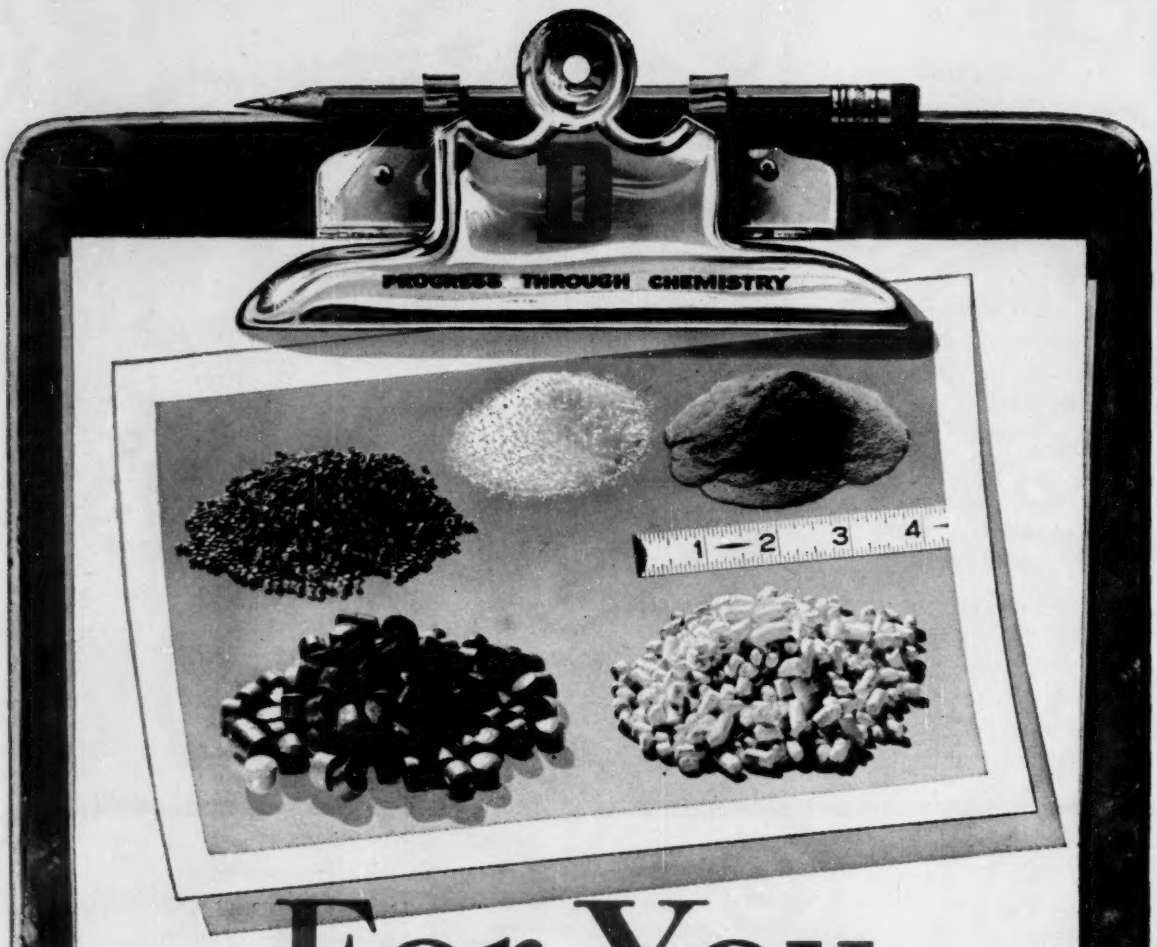
PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

It's the difference in performance that has made the "PAYLOADER" the decided choice in thousands of plants throughout the world —there are more in service today than all other makes combined. A "PAYLOADER" is your best investment now — and for the future.

THE FRANK G. HOUGH CO.
802 Sunnyside Ave., Libertyville, Ill.

- ☐ Send profitable bulk-handling reports
- ☐ Literature on model HA (1½ cu. ft.) and model HAH (1 cu. yd.) "PAYLOADER"
- ☐ Literature on larger units to 2¼ cu. yd.

Name_____
Title_____
Company_____
Street_____
City_____
State_____



For You

Catalyst "Know-How"

What makes one catalyst superior to another? Often it is the unseen ingredient, "know-how". Davison's long experience in successful catalyst production gives you this all-important element.

Davison, the first commercial producer of synthetic petroleum cracking catalysts, operates a modern plant for the sole purpose of producing specialty catalysts to aid industrial chemical progress. These catalysts can be custom made to your specifications. We guard your "know-how" as carefully as we do our own. They are made in many forms including granular, pelleted, powdered, spherical, extruded and include many supports and active agents.

Put Davison's "know-how" to work on your problem. No matter what your catalyst requirements are, it will pay you to discuss them with the Davison Field Service Engineer. A free booklet on Davison dependable catalysts is available on request.

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.

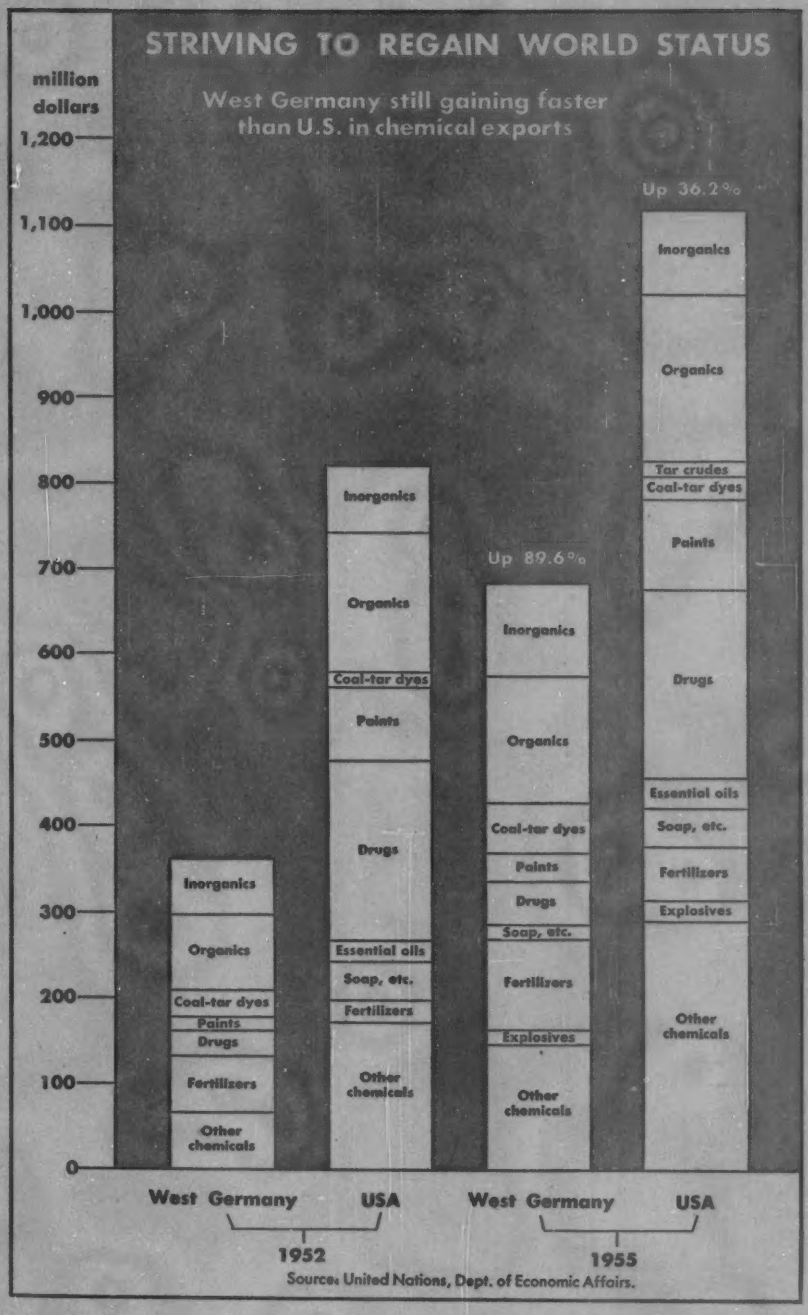
Baltimore 3, Maryland

Sales Offices: Baltimore, Md.; Chicago, Ill.; Columbus, Ohio; Houston, Texas; New York, N. Y.

Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole Producers of DAVCO® Granulated Fertilizer.

Charting Business

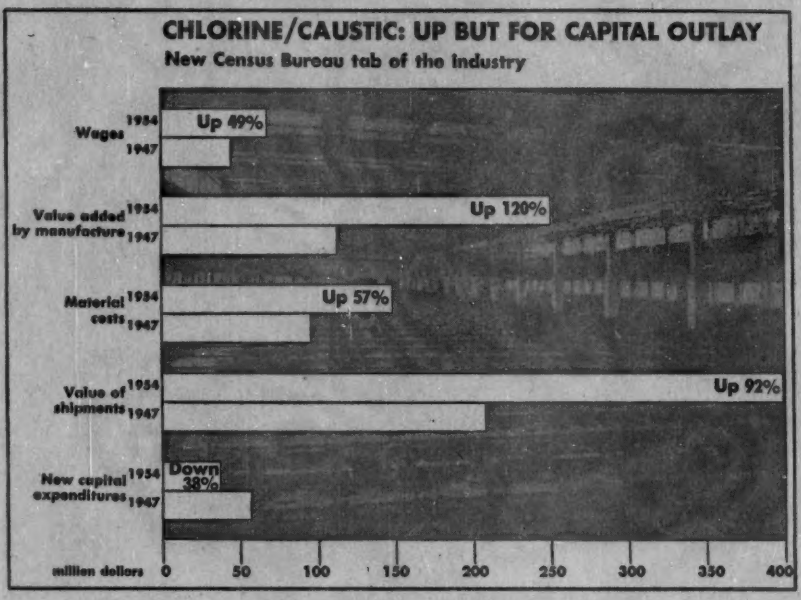
CHEMICAL WEEK
June 16, 1956



EAGER to regain its prewar eminence, West Germany's chemical industry continues its swift expansion. Latest measure of its competitive strength: West German chemical exports from 1952 to 1955 have jumped 89.2%, compared with a 36.2% increase in U.S. chemical exports. In the struggle for world markets, exports play a bigger role in West German chemical production than they do here. On a chemical sales turnover of $3.4 billion in 1955, West Germany's export sales were 20% of the total, compared with 4.9% of sales in the $23-billion U.S. chemical industry.

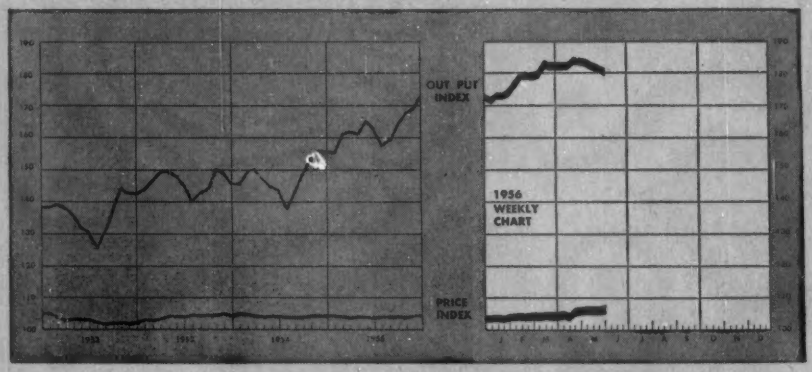
Charting Business

(Continued)



ACCORDING to the government's latest Census of Manufactures for the chlorine-caustic industry, capital spending for new plants in 1954 dropped off some 38% from 1947. Reason: the census year '54 marked the close of a 3-year chlorine-caustic expansion round. Today's picture: another expansion spurt has been triggered in the industry; capital spending for new plants and additions is increasing. Currently, chlorine-caustic makers operate at over 98% capacity.

BUSINESS INDICATORS



WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100))	178.8	180.3	164.2
Chemical Week Wholesale Price Index (1947=100)	105.6	105.7	104.3
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	464.1	461.0	430.7

MONTHLY

Foreign trade (million dollars)	Exports Latest Month	Exports Preceding Month	Exports Year Ago	Imports Latest Month	Imports Preceding Month	Imports Year Ago
Chemicals, total	112.6	96.7	93.3	27.1	23.5	27.8
Coal-tar products	5.9	6.1	6.3	4.8	2.9	3.5
Industrial chemicals	18.0	15.1	14.2	7.7	7.5	6.4

AS PARTNERS IN
YOUR PROGRESS . . .

OUR CONSCIENTIOUS SERVICE – is a *plus* factor!

Our service engineers are thoroughly familiar with electrothermic and electrochemical operations. They are competent to render high level technical advice to electrode, anode, carbon brick and mold stock customers.

The alertness of these service engineers in anticipating customer needs and wishes is a characteristic *plus factor* in the trustworthiness of GLC carbon and graphite products.

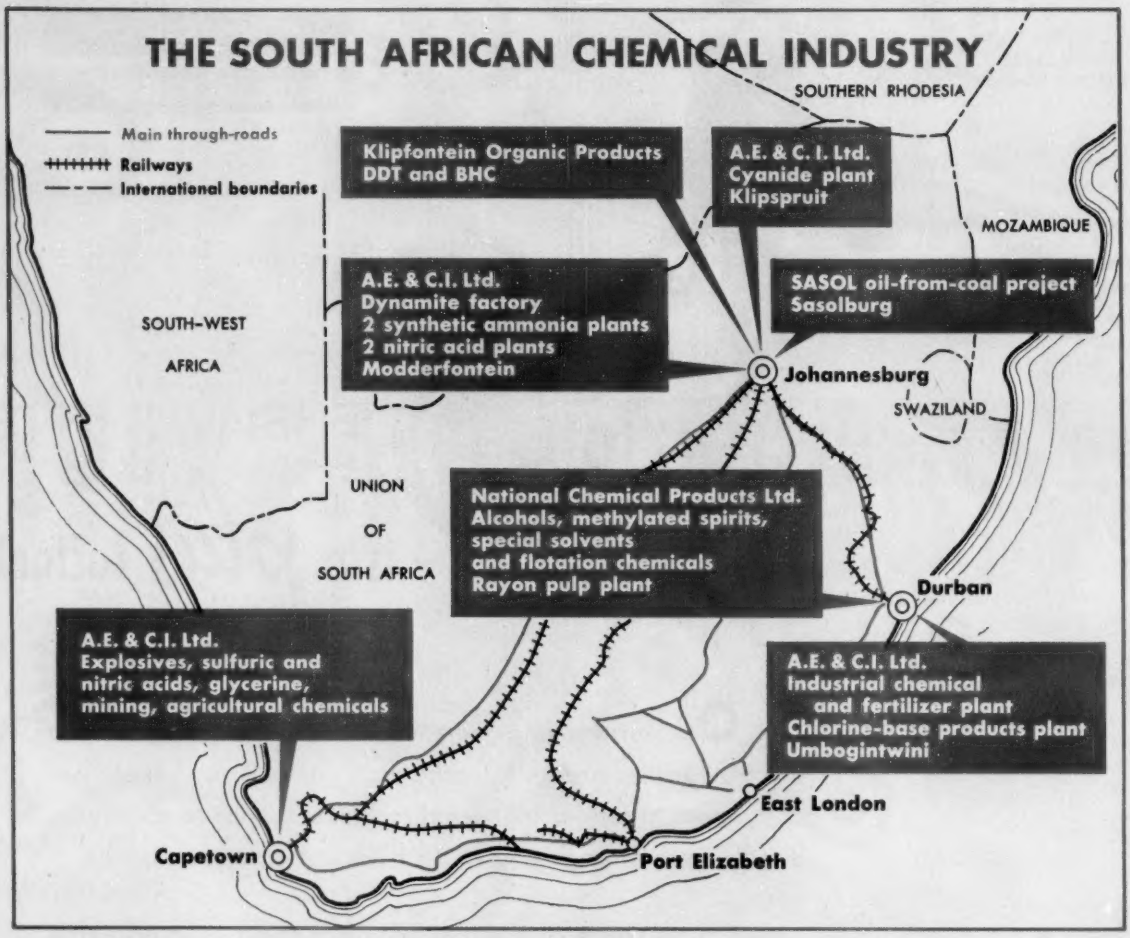
The high degree of integration between discoveries in our research laboratories, refinements in processing raw materials and improved manufacturing techniques is further assurance of excellent product performance.

ELECTRODE GLC® DIVISION

Great Lakes Carbon Corporation

GRAPHITE ELECTRODES, ANODES, MOLDS and SPECIALTIES

ADMINISTRATIVE OFFICE: 18 East 48th Street, New York 17, N.Y. PLANTS: Niagara Falls, N.Y., Morganton, N. C. OTHER OFFICES: Niagara Falls, N.Y., Oak Park, Ill., Pittsburgh, Pa. SALES AGENTS: J. B. Hayes Company, Birmingham, Ala., George O. O'Hara, Wilmington, Cal. SALES AGENTS IN OTHER COUNTRIES: Great Northern Carbon & Chemical Co., Ltd., Montreal, Canada; Great Eastern Carbon & Chemical Co., Inc., Chiyoda-Ku, Tokyo, Japan



South Africa: Sets for Chemical Spurt

New expansion, initial entrance into petrochemicals, and a goal of near self-sufficiency mark the current trend in South Africa's chemical industry.

Opportunities for outsiders: not exports to that country, but construction of South African plants to meet local demands.

IMPORTANT new chemical markets are beginning to open in Africa, particularly in its more populous and industrialized southern portion; but as of now, the outlook is that you won't be able to reach those markets with exports—you'll have to go into on-the-spot production to get in on the incipient boom.

And you may not have much time for planning, because South Africa's own chemical concerns—already that country's fourth largest industry—are set for sizable new expansions.

This latest growth—in an industry that until a few years ago was handicapped by having to import vast quantities of basic chemical materials—features construction of a $100-million, oil-from-coal plant. State-owned, its products will provide South African industrialists with the opportunity of entering into a new phase of the chemical industry—petrochemicals.

At present, there are no factories in South Africa capable of processing several of the proposed products of the new plant of South African Coal, Oil and Gas Corp.—nicknamed Sasol. But directors of the firm optimistically hope that private enterprise will recognize the benefits to be derived from erecting such plants. In the early days of the Sasol project, overtures were made to at least one U.S. company to encourage the construction of a South African plant to handle 6,000 short tons of crude phenols to be produced by the Sasol plant yearly. A lack of interest in the U.S. caused South Africa to ship limited quantities of phenols to Holland for further processing. The hope is that the Dutch, and others, might eventually establish plants in South Africa to sell processed chemicals locally.

Self-Sufficiency: Just as the Sasol project will open new vistas for the South African chemical industry, the recent emphasis on local production of more basic raw materials has served as a mighty stimulus.

The history of South Africa's second largest chemical manufacturing company—African Explosives and Chemical Industries (A.E. & C.I.)—is typical in this respect. A.E. & C.I.—the result of a partnership, formed in 1924, between Britain's Imperial Chemical Industries, Ltd., and the Anglo-American corporation, De Beers Consolidated Mines Ltd.—began by processing imported chemicals to produce the huge amounts of dynamite required, primarily in the gold fields. In recent years, A.E. & C.I. has spent large sums expanding its facilities—erecting ammonia and nitric acid plants—and now, except for glycerine, almost all of the raw materials required for what local boosters call the world's largest producer of dynamite are turned out right at home in South Africa.

An added benefit from this policy of near self-sufficiency has been the growth of the plastics, paint and lacquer industries. These industries have provided natural outlets for surplus nitrogen chemicals. In addition, South Africa produces almost all of its consumption of superphosphate fertilizer, ammonia, nitric, hydrochloric and sulfuric acid, manganese sulfate and chlorine.

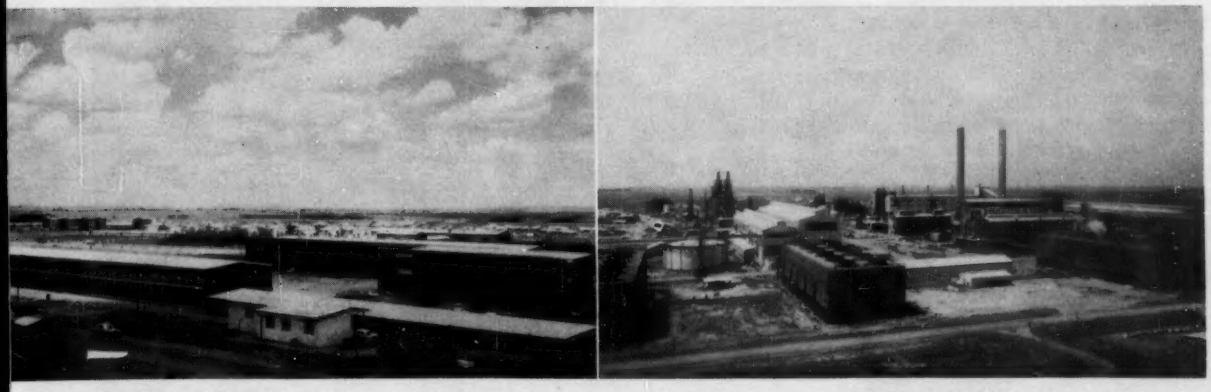
Important By-products: When Sasol was established in 1950—through governmental loans to the state-controlled Industrial Development Corp.—the rights to the Fischer-Tropsch process for manufacturing oil from coal were taken over from a privately owned corporation. Sasol was intended to be a much-needed gasoline producer, but it was soon realized that a wide range of by-products would help offset high construction costs. Consequently, emphasis was also placed on the production of alcohols, ketones and acids.

About two-thirds of the liquid fuels produced at Sasol comes from the M. W. Kellogg-designed unit, which also produces a large number of by-products.

The South African chemical industry—already a $224-million business employing upwards of 31,000 people—is growing rapidly. Several centers (*see map*) can boast of a number of chemical plants, and others are under construction. With the products of Sasol making available new raw materials for production of synthetic detergents, artificial rubber, plastics, soda ash, and other products, the growth curve appears destined for a steady climb.

Where does this promised expansion leave U.S. chemical producers? With a few exceptions, U.S. companies have not yet seen fit to enter South Africa's chemical industry. Recent chemical expansion in South Africa, a booming economy and a determination to approach self-sufficiency combine to present new but hard-to-gauge opportunities for U.S. businesses on the not-so-dark continent.

A CENTURY'S SUPPLY: Neighboring Sigma Colliery meets Sasol's coal needs.



FROM SASOLBURG: Oil from coal, plus a host of intermediates vital to growth of South Africa's chemical industry.

BIER STUDIOS, MONTREAL

LAWYER GOUDREAU: For nonlawyers, how to win, hold and use patents.

Patent Tips for Laymen

With lectures in both English and French, the University of Montreal has been giving an unusual noncredit course that's making a hit with chemical company management, researchers, patent attorneys, and the Canadian Patent Office.

It's labeled "Industrial and Intellectual Property: a practical course in patent laws and trademarks for chemists, engineers, pharmacists, industrialists and inventors," and it's viewed as a potential money-saver and money-maker for both employers and researchers.

While nearly every law school in both Canada and the U.S.—including the University of Montreal—offers patent law courses, this one differs in that it's not for lawyers; rather, it's intended for people in commerce and industry who make and use discoveries in science and technology.

Time and Money: To patent attorney Roger Goudreau, a graduate of the university's law school and founder of the patent law course for laymen, the lectures hold considerable promise as time- and money-savers for industrial research organizations.

"Most research chemists," he asserts, "display an alarming lack of patent knowledge. They're frequently in the dark as to which of their results can be exploited commercially. Obviously, when their lab achievements are covered by previous patents, their time and effort has yielded small reward."

Companies that hire research chemists stand to gain in many ways, Goudreau continues. For one thing, more of the processing of patent applications can be handled in the laboratory if the chemists know the ropes —setting up priority dates, witnessing lab books, establishing conception dates. This saves time for company executives and for patent attorneys (who are in scarce supply in Canada now, with only about 100 currently practicing), and also makes it more likely that easy-to-defend patents will be issued for discoveries.

Adds Alan Swabey—law firm president and one of the lecturers—"Chemists who take this course are more alert to possibilities of patenting, more useful in their dealings with patent agencies. They're not so likely to overlook profitable inventions. Details that strike a chemist as insignificant may be crucial to a patent attorney."

Chemical Patent Boom: Among the course's boosters—and also one of its guests lecturers—is Canada's Commissioner of Patents Wilfrid Michel, himself a chemist by training. With more original research in chemistry going on in Canada now, the number of chemical patent applications in that country has jumped 20% over the past decade to nearly 7,000/year.

This helps to explain why most of the 48 students in the 15-week course this past spring were from chemical companies. Comments one chemical firm's research director: "I would have spared myself a lot of grief if I could have taken this course 10 years ago."

NOTMAN & SON, MONTREAL

SWABEY, MICHEL: In Canada, a 20% rise in chemical patent applications.

Unions Bid for Wage Parity

Chemical labor unions are engaged in new attempts to jack up Southern wage rates to Northern levels. Involved are a series of moves to increase minimum pay scales under the Walsh-Healey law (a) on a nationwide basis, and (b) to figures substantially higher than the general $1/hour federal minimum wage that went into effect in March.

In four important chemical industry segments—industrial chemicals, pharmaceuticals, soaps and protective coatings—the new $1 minimum will become the floor for Walsh-Healey determinations this month. This follows the 30-day waiting period that began late in May with Labor Secretary James Mitchell's approval of the $1 rate for work under contracts with the U.S. government. The formal waiting period allows interested parties to file exceptions—but no delay is expected.

However, the chemical unions are setting their sights quite a bit higher; and one reason is their dislike for traditionally lower wages in the South. At industrial chemical plants, regional wage differentials have generally been increasing in recent years *(see table, below)*, despite union efforts to narrow the gaps. Boosting the W-H minimum to, say, $1.30/hour would have considerable impact on Southeastern plants in this field, where—as of last August—about 12% of production workers were earning less than that amount. For industrial chemical plants throughout the U.S., however, only 1.7% of hourly paid employees had average hourly earnings below that figure.

No Change Till Fall: Because of procedural requirements, no action on the unions' requests is expected for several months, at least, Here's how the four moves stand as of this week:

- In pharmaceuticals, a labor-management advisory committee met with Labor Dept. officials in March; a wage survey is being conducted now; public hearings will be held in the fall.
- In industrial chemicals, the advisory committee met last month; a wage survey is under way; hearings are expected in late autumn.
- In soaps, the advisory panel was to meet this week.
- In paints and varnishes, the preliminary meeting still hasn't been scheduled.

How successful the unions will be in this scheme to hoist Southern wage rates is hard to gauge. The Supreme Court has upheld Mitchell's authority to set industry-wide standards, but he's not likely to go so far as the unions want—which may be even more than $1.30/hr.

NORTH-SOUTH WAGE GAP: STILL WIDENING

(Difference in average straight-time hourly earnings for various chemical-plant job classifications, all-U.S. and Southeast states)

Occupation	Oct. 1951 Differential	4-year increase in all-U.S. average	Aug. 1955 Differential
Carpenter, maintenance	37¢/hour	37¢/hour	30¢/hour
Chemical operator, class A	36¢	31¢	31¢
Filling machine tender	43¢	24¢	48¢
Guard	12¢	34¢	16¢
Janitor	26¢	27¢	27¢
Laboratory assistant	21¢	33¢	39¢
Pipe-fitter, maintenance	23¢	40¢	26¢
Stock clerk	16¢	39¢	32¢
Truck driver	29¢	33¢	43¢

Source: U.S. Bureau of Labor Statistics.

WIDE WORLD

GOVERNOR TIMMERMAN: To break legal barrier, a special session.

LEGAL

Land Limit Boosted: An old state law that was blocking plans for construction of a $100-million sulfate pulp mill in South Carolina has been radically revised to encourage industrialization in the Palmetto State. Gov. George Bell Timmerman summoned the legislature into a special session and explained that the 500-acre limit on land ownership by any "alien" was deterring Delaware-incorporated Bowater Southern Paper Corp.—a subsidiary of Britain's Bowater Paper Corp. Ltd.—from locating near Rock Hill on the Catawba River in York County. In a brief (four hours) session, the legislators upped the limit to 500,000 acres. It's expected that the 100,000 tons/year plant will ultimately have 1,200 employees with a $2-million annual payroll. Also, Bowater is considering construction of a paper mill on the same site to produce papers for the packaging industry.

Another legal problem surmounted: By way of conforming with pollution rules, Bowater has agreed to treat plant wastes and limit discharges into the river.

•

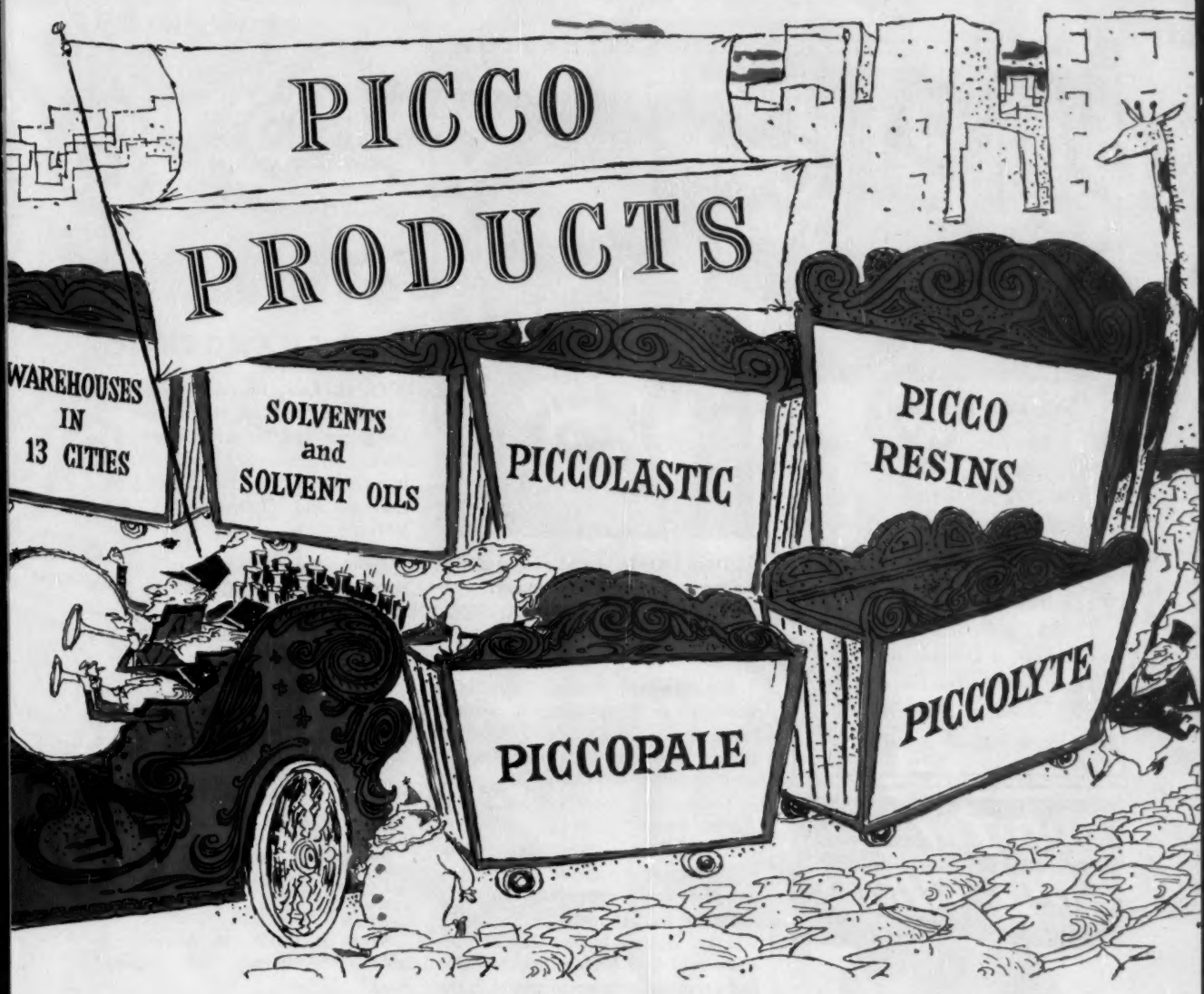
Competition in Containers: To what extent can you invest in common stock of a competing company? Latest word from the Federal Trade Commission on this subject is in the form of a consent decree signed by Union Bag & Paper Corp. and Hankins Container Co., producers of corrugated boxes and sheets. The decree bars the two firms from making any agreement for an interlocking directorship or for limiting production or restricting stock transactions with other parties; but it permits Union Bag to hold its present 9% interest in Hankins. Proviso: that this stock is to be held for investment only, and will not be voted in such a way as to lessen competition.

•

Sulfur Suit Started: A Texas farmer is asking judgment for $62,000 in a civil suit against Standard Sulphur Co. (Rosenberg, Tex.). He charges that sulfur dust blown from the company's nearby railroad carloading facility has made his 75-acre farm "wholly and permanently unproductive."

•

Trademark Upheld: In federal district court at New York, Judge Edmund Palmieri has granted a preliminary injunction against use of "C No. 5" as a tradename for perfume. The injunction was requested by Chanel, Inc., on grounds that this infringed the "Chanel No. 5" tradename. Judge Palmieri ruled that "Chanel," "No. 5," and the linked "C" monogram are valid trademarks, and ordered defendant Le Sure Co. to refrain from using the disputed designation until the case is tried and decided.



FIELD SERVICE Pennsylvania Industrial Chemical Corporation operates warehouses in many industrial centers, from which prompt shipments are made. District sales offices (see below) are staffed with experienced technical representatives who are well-qualified to assist in the application of Picco products.

Pennsylvania Industrial Chemical Corp.

Clairton, Pennsylvania

Plants at:

Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

District Sales Offices

Boston, New York, Detroit, Chicago, Cincinnati
Los Angeles, Philadelphia, Pittsburgh

Pennsylvania Industrial Chemical Corp. (CW)
Clairton, Pennsylvania

Please send me a copy of your bulletins describing the following Picco Products_____

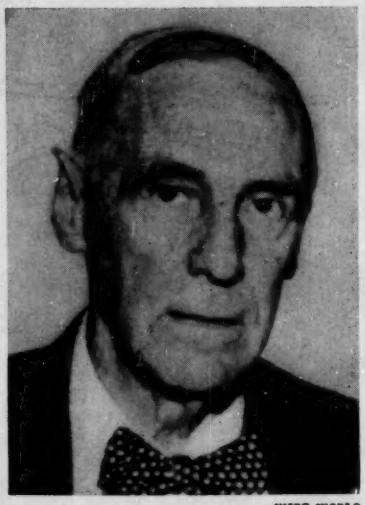
and samples of suggested grades for (application)_____

Name_____ Position_____

Company_____

Address_____

ADMINISTRATION



WIDE WORLD

JUDGE DOBIE: In offering seniority, timing makes all the difference.

LABOR

Superseniority Barred: In offering preferred seniority status to workers hired or reinstated during a strike, timing makes all the difference, according to the U.S. Court of Appeals at Richmond, Va. In a decision written by Judge Armistead Dobie, the court upheld a National Labor Relations Board ruling against Olin Mathieson Chemical Corp. (New York), in a dispute that arose after settlement of a strike. Dobie said that Olin Mathieson would have been in the clear if it had promised permanent tenure to the nonstriking workers during the strike; but that it was "quite a different matter" to impose a "superseniority policy" after the strike. The employer, Dobie asserted, was penalizing the strikers for exercising their right to strike and also thereby discouraging any future exercise of this right. "This," he concluded, "the employer cannot lawfully do."

•

AFL-CIO Picks Target: As AFL-CIO's two chemical unions plug away at their proposed organizational blueprint that will qualify them to receive material aid from AFL-CIO headquarters, the federation's organization department has apparently decided to make a Southern tobacco plant its first big target in the much-publicized organizing drive. Tentatively, at least, No. 1 objective for AFL-CIO Director of Organization John Livingston is the R. J. Reynolds Tobacco Co. plant at Winston-Salem, N. C.

On the chemical front, a six-man committee is drafting two lists of chemical plants slated for unionizing efforts. One group of plants will be assigned to International Chemical Workers Union, the other to Oil, Chemical & Atomic Workers.

KEY CHANGES

G. H. Law, to vice-president, research; **H. M. West,** to manager, textile fibers; and **Franklin Johnston,** to director of research, Carbide and Carbon Chemicals Co., division of Union Carbide and Carbon Corp. (New York).

Simon Askin, to chairman of the board; **Walter J. A. Connor,** to president; and **James K. Lindsay,** to secretary-treasurer, American Plastics Corp. (New York).

Michael Pisetzner, to vice-president and general manager, American Molding Powder and Chemical Corp. (Brooklyn).

William J. Barrentine, to treasurer, Haveg Industries, Inc. (Philadelphia).

Frank C. Hildebrand, to vice-president, General Mills, Inc. (Minneapolis).

Arvon L. Davies, to managing director, Chemstrand, Ltd. (Decatur, Ala.).

Ernest T. Handley, to executive vice-president; **Frank J. Groten,** to vice-president in charge of chemical sales; **Kenneth L. Edgar,** to vice-president in charge of Velon sales, Firestone Plastics Co. (Pottstown, Pa.).

Howard K. Nason, to vice-president, Monsanto Chemical Co. (St. Louis).

William L. Benger, to controller, International Salt Co. (Scranton, Pa.).

J. Justin Basch, to vice-president in charge of product development, Oakite Products, Inc. (New York).

William J. Jennings, to executive vice-president, Crowley Tar Products Co., Inc. (New York).

Reid Tull, to vice-president in charge of sales development, Proctor Chemical Co., Inc. (Salisbury, N. C.).

MOISTURE: Infrared spectrophotometer is used to determine moisture content of propellent. It's one way aerosolers are getting product uniformity.

PRESSURE: Safe pressures—even propellent composition—can be determined by pressure test of aerosol in constant temperature bath.

Research—

Firmly ensconced in the quarter-billion-dollars/year range after less than a decade of existence, the aerosol industry is a true phenomenon of the chemical specialties field. Its past growth has been a compound of many things—a convenience-minded public willing to try new ideas, a host of products that do valuable jobs, prosperous times, to name a few. On what can it base its future success?

Last week, CHEMICAL WEEK asked this question of a number of firms in the aerosol field. From their replies, it's plain that keeping up the rapid growth pace (30% last year) is going to mean a lot of work—research work, in the opinion of many. Here's why:

End of a Day: The day of pressure-packing as a novelty is over. The industry that revolutionized the shave cream world and created the hair spray business (both now in the near-50-million-units/year category) did so because—in these particular markets—its package offered solid advantages over previous packages.

Aerosolers are now fully aware of this—which explains why the pell-mell rush of a few years back to pack everything under pressure has subsided. Because firms better understand what items are suitable for aerosols, the number of "new" products in aerosol form introduced in '55 was far below that of the preceding 3-5 years.

"There was never much future in aerosol-packed fountain-pen ink," concedes one filler. Recent aerosol sales growth has consisted of gains made by a limited number of products.

On the Verge: Trial-and-error formulation work, mainstay of aerosol research, so far, has brought the industry to the verge of major advances in pharmaceuticals, food products, powder materials *(CW, May 17, p. 142)*. The breakthroughs in these fields will likely be made within two years by this same kind of technical service work.

Where more basic research is concerned, the industry is uncertain. A Pacific Coast firm puts it this way: "Research is slow in paying off. And, despite its successful record, the aerosol industry is still a small one—far

Base for a Future Aerosol Boom

from able to sink money into plans with a long-term payoff."

To many firms, there is still question as to whether it would be profitable to get complete data of a basic nature for their products. Again, there is the cost, in time and money, of obtaining this information. It's hard to prove exactly how a better product —hair lacquer, paint—can result from complete knowledge of the effects of such factors as viscosity, spraying temperatures, pressure, and valve design.

The consensus, however, is that the research will have to be done, But there's plenty of debate about just how much work can be of profit to the field, and who should do it. Here's where work is being done, and likely areas for future study:

• **Spray:** Since most aerosols are sprays, it would seem that such matters as spray pattern and particle size, for example, would be deeply probed. The fact is that, except for aerosol space insecticides (the product that gave much of the initial impetus to the industry), few products have been thoroughly investigated on these counts. George Barr, Inc., stands out as one of the few firms making real studies in this area.

U.S. Dept. of Agriculture did much of the work on the insecticides, determined just what particle sizes were most effective. On the strength of this data, it set the limits on particle size and spray pattern. The Chemical Specialties Manufacturers Assn. has since made considerable effort to standardize these test procedures; but even now, few firms in the industry are equipped to make even basic standard tests.

• **Package:** When glass became available as a container for pressure-packed items, it removed a barrier to many new products. As a relatively costly container, though, it countered the trend toward low-cost components —a trend that has helped broaden aerosol acceptance. The glass's inertness is valuable, but the industry is limited in what it can pay for it.

Metal containers are still prime units for aerosol use. Can manufacturers are, of course, interested in the aerosol industry, which consumes 250,000-300,000 cans each year. But they must devote the bulk of their research to fields that are far better customers than is the aerosol industry. Canmakers won't spend money to develop a lining material for synthetic-detergent shampoo cans, for example, when research costs are likely to outbalance profits.

One filler ruefully told *CW* that he tries every inhibitor he can get his hands on, and runs shelf-life tests continuously; but he simply hasn't the facilities to develop new linings. So, for now, at any rate, the industry must get by on available vinyl, epoxy, and phenolic linings.

• **Valve:** Developed especially for the aerosol industry, and in many cases made by firms whose total output is virtually absorbed by the aerosol industry, valves offer considerably more encouragement. Stiff competition in the field constantly improves quality, lowers prices, broadens applications. Design of a fully satisfactory valve for dry powders is a current headache, but valve makers seem confident of finding a remedy.

• **Propellent:** Parent (in many ways) of the aerosol field, fluorinated hydrocarbon gases are extensively and continuously researched. First to offer the common propellent gases, Du Pont has done the most work on them —and, for that matter, on aerosols in general. The immiscibility of the fluorinated gases with water-base products is limiting the packaging of formulations of such mixtures (shave creams are a big exception). Du Pont is seeking to broaden the range of products based on water, perhaps by the development of an emulsifier. Another approach to the same problem has been Chemway Products' low pressure, three-phase system.

Other propellent gases have been investigated, but, except for carbon dioxide and nitrous oxide in food products, none has gained wide use. Work on other gases—butane, even rarities like neon, argon—is being pushed, according to Connecticut Chemical Research; but actual commercial formulations containing these materials are not yet on the market.

• **Safety:** With products going into households throughout the nation, aerosol makers have a vital interest in the safety of their products.

Research is being done in two areas in particular: flammability of formulations; and hazards of overpressurized

HEAT: For shelf-life simulation to ascertain leakage and possible decomposition, samples are aged at elevated temperatures.

cans. With the aid of CSMA, standardized procedures for testing flammability have been worked out. But checking the pressure of production-line containers is another problem. Accurate, reproducible results in pressure gauging are hard to come by, and the industry hasn't yet settled on methods.

The amount of work that has already been done is considerable for the short life-span of the industry. And the drive that has rocketed aerosols to their current prominence seems likely to carry into the research that aerosolers hope will continue their industry's climb.

Drug Rules Remodified

Further modification of the rules for clearing new drug products (CW, May 5, p. 80) is now planned by the Food & Drug Administration. The industry has until the end of June to offer comment on the proposed changes.

These are the essential new points, as FDA published them in the *Federal Register* for May 30:

- A limiting definition of the term "new drug," so that it covers drug components that are "in fact new." This somewhat repetitive definition was created to cut down on the information required in applications. Detailed information on synthesis can be left out in cases where the "new" drug has been produced before, or by others.

Also, copies of the original data may be submitted in place of the originals, and reference to data already on file can be made part of the applicable reference material.

- Where clinical tests have been made with a new drug, information on that new drug's manufacture is needed only in cases where the manufacturing process or synthesis differs from the current method of manufacture.
- Full clinical data on tests concerning the product's safety must be included. Industry proposed to submit only conclusions.
- Applicants now can specify reasonable alternatives to the composition or manufacturing process used. This eliminates many supplemental applications.
- Suspension or rejection of application will be made only for omission of vital safety data and for other reasons of that nature.

There are numerous other fine points of change, all designed to save both industry and government time and trouble — and to speed up the action on new drugs.

Fund Raiser

Colgate-Palmolive reports "wonderful response" during the first month of its promotional campaign to raise $100,000 for the U.S. Olympic Fund. It has offered to contribute a dime to the fund for each product boxtop or wrapper returned to it during May, June and July.

The firm hopes to get at least 1 million tops from the 12 products in the plan—Palmolive and Cashmere Bouquet soaps, Fab, Ad and Vel detergents, Colgate Dental Cream, Palmolive Shave Cream, Veto Cream deodorant and Halo Shampoo, Cashmere Bouquet Talc, Palmolive Rapid Shave, and Ajax. The boxtops or wrappers may be turned in at stores, or mailed to the firm.

Some 324 U.S. athletes are hoping to make the trip to Australia this November for the games—if sufficient funds are raised.

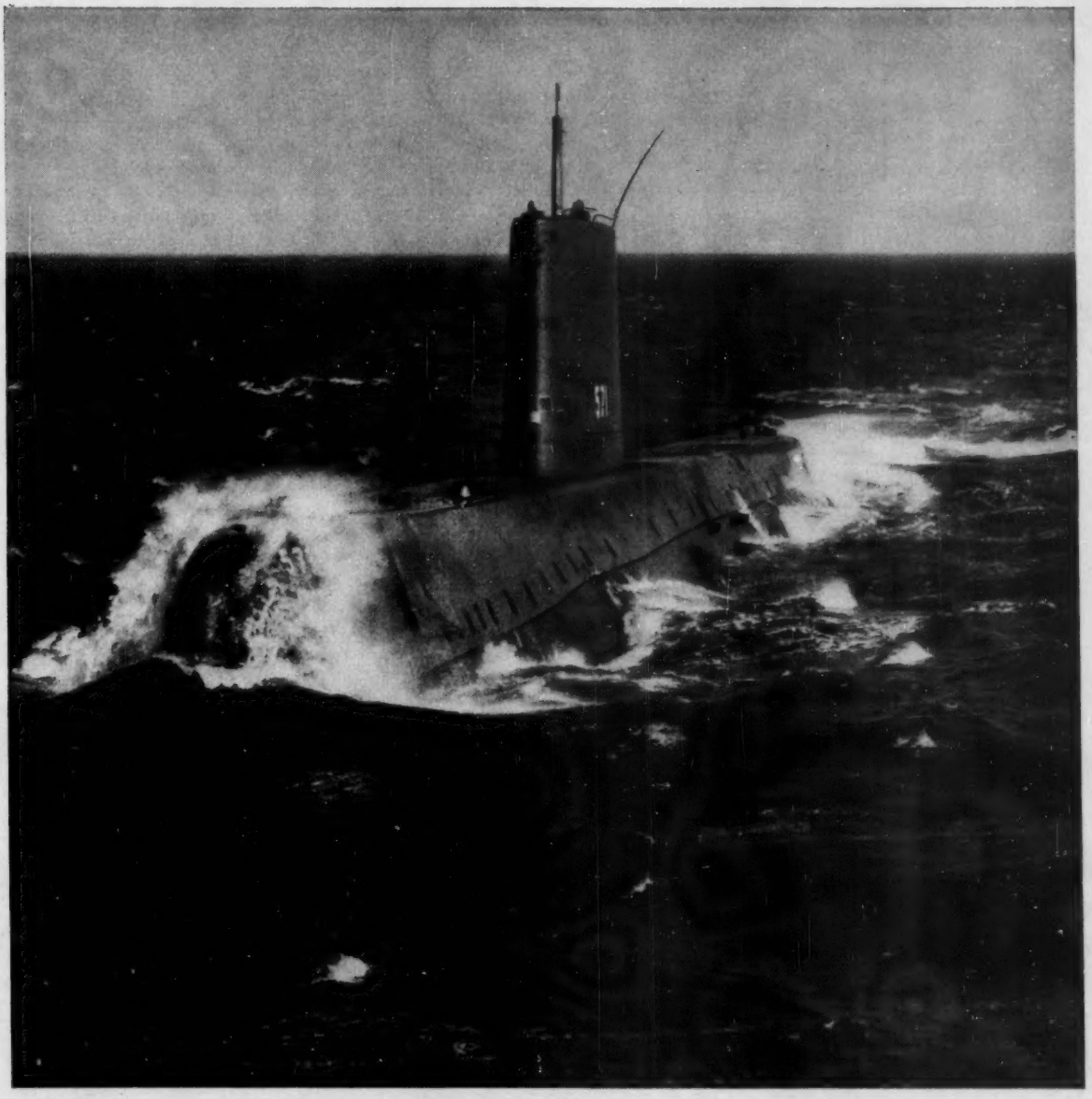
Home-Filled

A refillable purse-size hair-spray aerosol is being introduced by Helene Curtis. The new product is sold in two parts: the glass unit, with special spray valve; and the metal supply-can, with a filling nozzle. When the glass unit gets low on lacquer, the plastic valve button is removed and the supply can's filling nozzle fits into the buttonless value.

Contents may then be transferred by holding the can over the glass unit (which has been chilled, if possible, in a refrigerator). Finally, the valve button is replaced. Newman-Green, Inc. (Chicago) makes both the spray valve and transfer valve.

•

Mix Nixes Spots: Part of the problem of combating the Mediterranean fruit fly (*CW, June 9, p. 58*) involves Miami automobile owners. It seems that first sprays suggested for countering the Medfly had a tendency to spot automobile finishes—so the cars would have to be washed and waxed after each application of the baited insecti-



THE U.S.S. NAUTILUS, world's first atomic-powered submarine, represents a revolutionary new application of nuclear research.

FIRST IN ITS CLASS!

The U.S.S. Nautilus, first of a new class of nuclear-powered submarines, is an outstanding example of what continuous research and advanced technical skill can achieve. In the industrial field it is the same kind of constant research and engineering know-how that make Esso Petroleum Solvents outstanding for fine product character and high quality. Years of careful testing and continuing product improvement are your assurance that Esso Petroleum Solvents will meet your most exacting standards. For information or technical assistance, call your local Esso office or write: Esso Standard Oil Company, Solvents Division, 15 W. 51st St., New York 19, N. Y.

ESSO

PETROLEUM SOLVENTS

RESEARCH AND EXPERIENCE DEVELOPED THE FINE CHARACTER OF ESSO SOLVENTS

SPECIALTIES

cides. Latest formulations of the malathion-insecticides, however, made with protein hydrolysates, are said to somewhat alleviate the spotting problem. Last week, first planes for the spraying job had arrived in Miami.

•

Packed for Commuters: Aerosols highlighted the latest phase of Allied Chemical Corp.'s program to acquaint potential investors with the company's operations. Part of its display at the Merrill Lynch, Pierce, Fenner and Beane exhibit at Grand Central Terminal, New York (*CW, May 26, p. 88*) is a lab setup for both pressure- and cold-filling aerosols. Shave cream and air fresheners are turned out on the spot. Allied's interest in aerosols stems from its manufacture of Genetron propellents—fluorinated hydrocarbon compounds.

EXPANSION

Change and Addition: Detrex Corp. (Detroit), which will soon change its corporate name to Detrex Chemical Industries (*CW, June 9, p. 64*), plans to manufacture package-type conveyors (now made by B & G Machinery Co., Indianapolis) such as are used in laundries. Detrex is a major supplier of laundry and dry-cleaning chemicals.

•

Add Division: A pharmaceutical division was recently formed by Shulton, Inc. (Old Spice). To market proprietary pharmaceuticals, the division will begin operations with the introduction of Thylox Medicated Soap and Thylox Medicated Cream—for treatment of skin disorders.

PRODUCTS

De-binder: For freeing "frozen" nuts, bolts, bearings, etc., from the grip of rust, Krylon Inc. (Norristown, Pa.) is now introducing an aerosol penetrant oil. The new product, packaged in a pint pressure container, sells for $1.69. Name: Rust Release.

•

Added Fumigant: Chloropicrin, widely known soil fumigant chemical, has been added to Dow Chemical Co.'s line of agricultural chemicals. Tradenamed Picfume, the chemical supplements the firm's methyl bromide soil-treating chemicals.

•

Stabilizer: Advance Solvents & Chemical Co., division of Carlisle Chemical Works, is marketing a new stabilizer for vinyl resins used in floor tile and other applications. A co-precipitated barium-zinc soap, the new material, Advastab XZB-155, is a free-flowing white powder, sells for about 70¢/lb. in quantity.

•

Road Sealer: A completely reformulated asphalt-sealing compound is now being sold by Monroe Co., Inc. (Cleveland) under the tradename Black Top Seal. The product is said to make bitumen surfaces resistant to oxidation, abrasion, drying.

•

Beach Bag Tie-in: To push summertime sales of its Sun 'n' Surf suntan lotion, Squibb, division of Olin Mathieson Chemical Corp., is making a combination offer—a 59¢ tube of its lotion and a $1.75 beach bag for $1.59.

•

Preshave Treatment: Recent emphasis on ladies' electric shavers has created a need for a new cosmetic—preshave talc. The House of Twain, Inc. (Chicago), is now selling such a product, Lovely Lady, in a 2-oz. plastic bottle for $1.

•

No Spot: A new dye carrier said to eliminate carrier-spotting of Dacron and its blends has been introduced by Tanatex Corp. (Kearny, N. J.). Tagged Tanavol, the carrier is said to have the advantages of phenolic carriers—one-step dyeing, high color yields, and light-fastness.

•

Fly Killer: Montecatini (Italy) is introducing a couple of new insecticides —Rogor, a specific for the olive fly (a pest of the olive growers in the Mediterranean basin), and Dition, an insecticide said to be effective against the common house fly. The latter has residual effect.

•

Highway Liner: A new traffic paint, Cataphos, and unit to apply it have been developed by Aerostyle, Ltd. (London, England). The paint is said to be "plastic-based," quick drying, long wearing. The striper is gasoline-powered, permits operator to see both the road ahead and the line as it is put down.

•

Safe Hardeners: A pair of low-

SPECIALTIES

toxicity hardeners for epoxy plastics have just been introduced by Furane Plastic, Inc. (Los Angeles). Coded Hardeners 946 and 986, they are the result of an attempt to develop materials of this type that do not irritate the skin. Hardener 946 yields (Furane has its own Epocast series of resins) a pot-life of 10-15 minutes; 986 gives 25-30-minute pot-life; both are water repellent.

• Furane has also introduced a new hot-melt plastic (Hot Melt H-883-A) to support stainless steel honeycomb structures while they are being machined. The compound is melted, poured into the honeycomb structure before machining, hardens to provide support. The resin is melted out by heating the unit to about 200 F.

•

Red Note: Arcturus Reds designate a pair of new red azo toners sold by Sherwin-Williams' Pigment, Color and Chemical Division. Developed for use in printing ink, rubber and plastics, the products are available in both resinated (Arcturus Red CP 1275) and nonresinated (Arcturus Red CP-1270) form. Claimed features: good stability, resistance to bleeding (in both water and oil), good body retention and flow, little or no thixotropic effect even after aging. The new materials, S-W says, are low-cost.

•

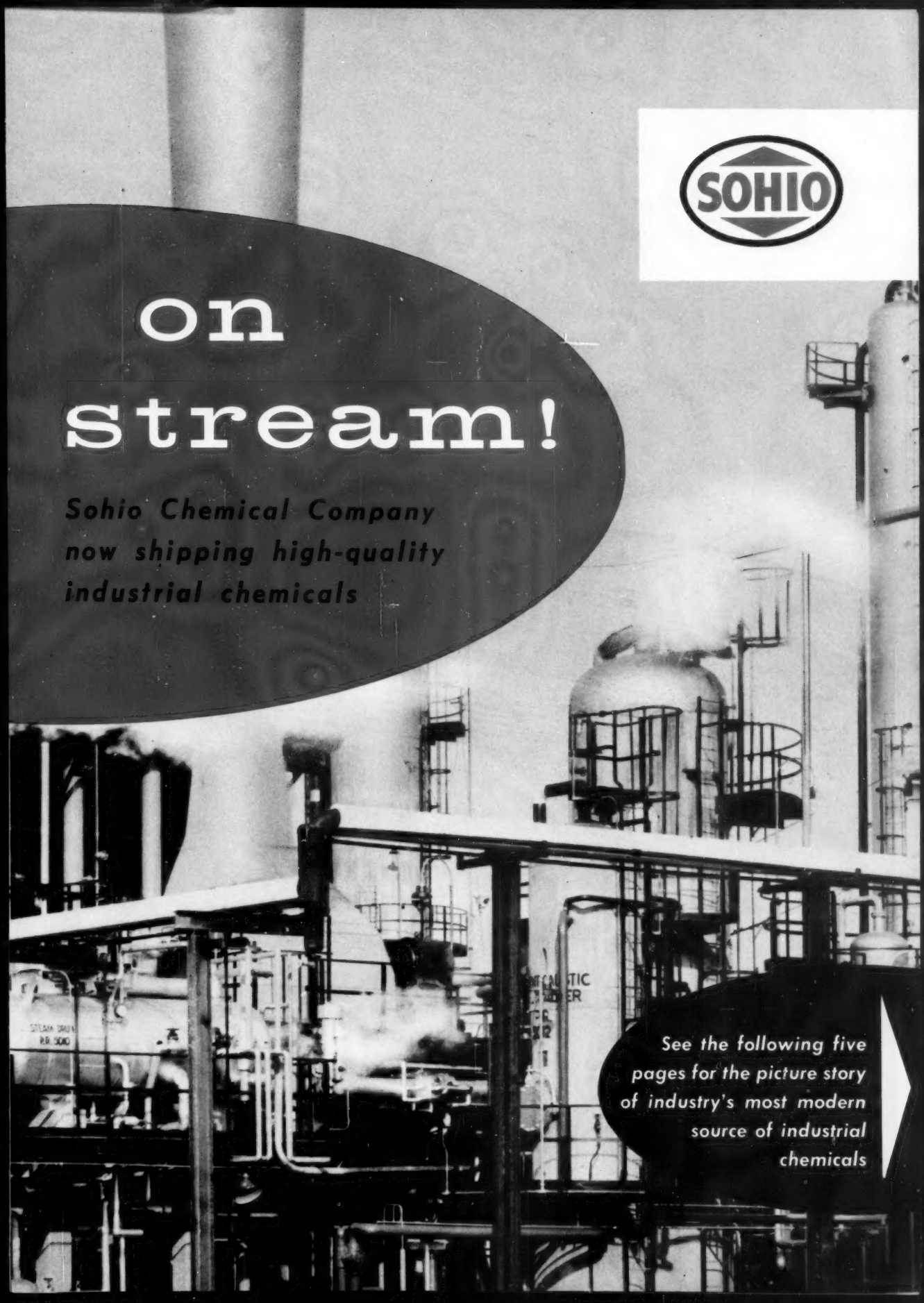
Two Gallons a Minute: For the larger quantities of demineralized water now demanded in medical, scientific and industrial fields, Crystal Research Laboratories, Inc. (Hartford, Conn.) offers its big 2-gal./minute Deemajet Model DJ-128. The nonmechanical, pressure-operated ion-exchange unit connects to a faucet, features up-flow jet feed. The unit retails at $39.50 (a 1-gal./minute unit sells at $25).

•

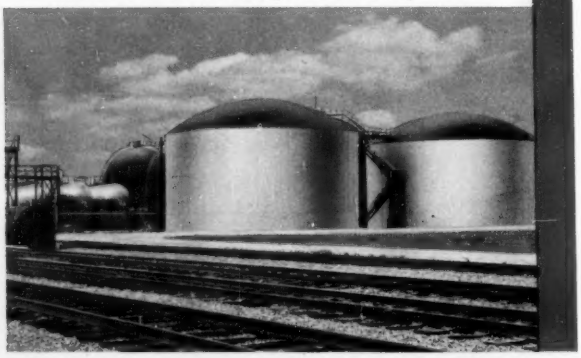
Poultry Pair: Two new veterinary products for poultry use—Aquavac Newcastle Disease Vaccine and Aquavac Infectious Bronchitis Vaccine—are being marketed by Lederle Labs. Both may be given to chickens in their drinking water.

•

Girdle Glider: An aerosol girdle powder is being packaged. Comprising a deodorant (hexachlorophene) and perfumed talcum powder, the Eppi Products Corp. (Cleveland) offering is called Girdle Spray.


SOHIO
on
stream!
Sohio Chemical Company
now shipping high-quality
industrial chemicals
See the following five
pages for the picture story
of industry's most modern
source of industrial
chemicals

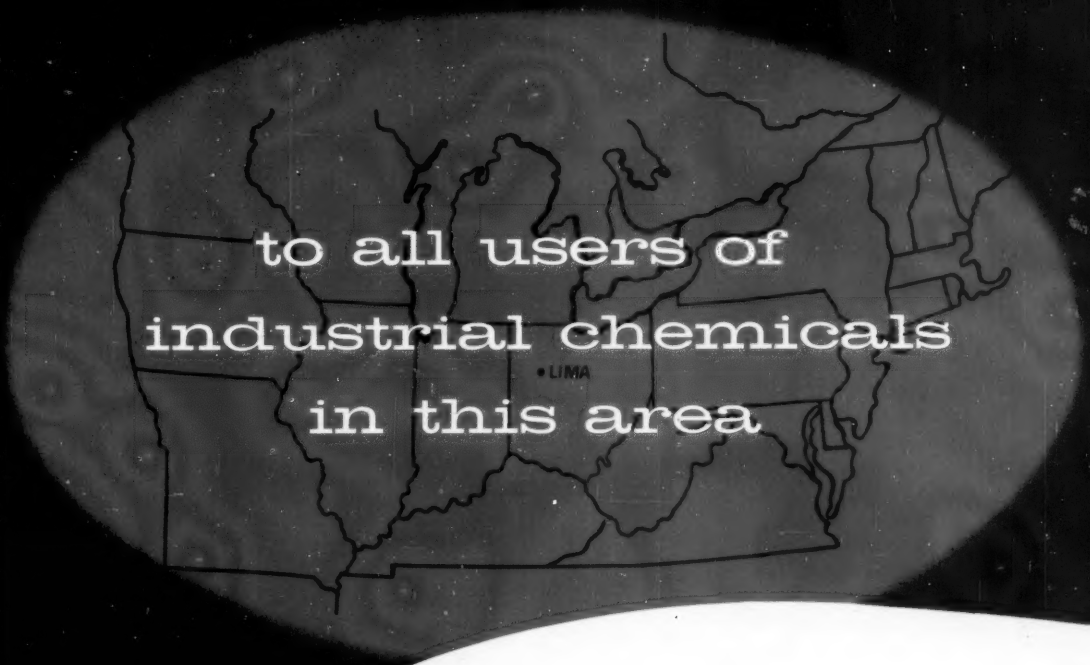
Ample anhydrous ammonia storage more than assures deliveries during peak demand periods.



Largest storage facilities in country in relation to production capacity.

DRAWING on the best available experience in the chemical industry, Sohio surveyed every known method of ammonia and urea production. Selecting the most efficient and reliable of processes to produce the highest quality products, the ultimate in a modern petrochemical plant was designed. No effort, no expense was spared. Users of industrial chemicals were questioned as to their product and delivery needs. Research and production departments were staffed with outstanding men. The new Sohio chemical plant at Lima is as perfect as men and materials can make it.

AN INVITATION

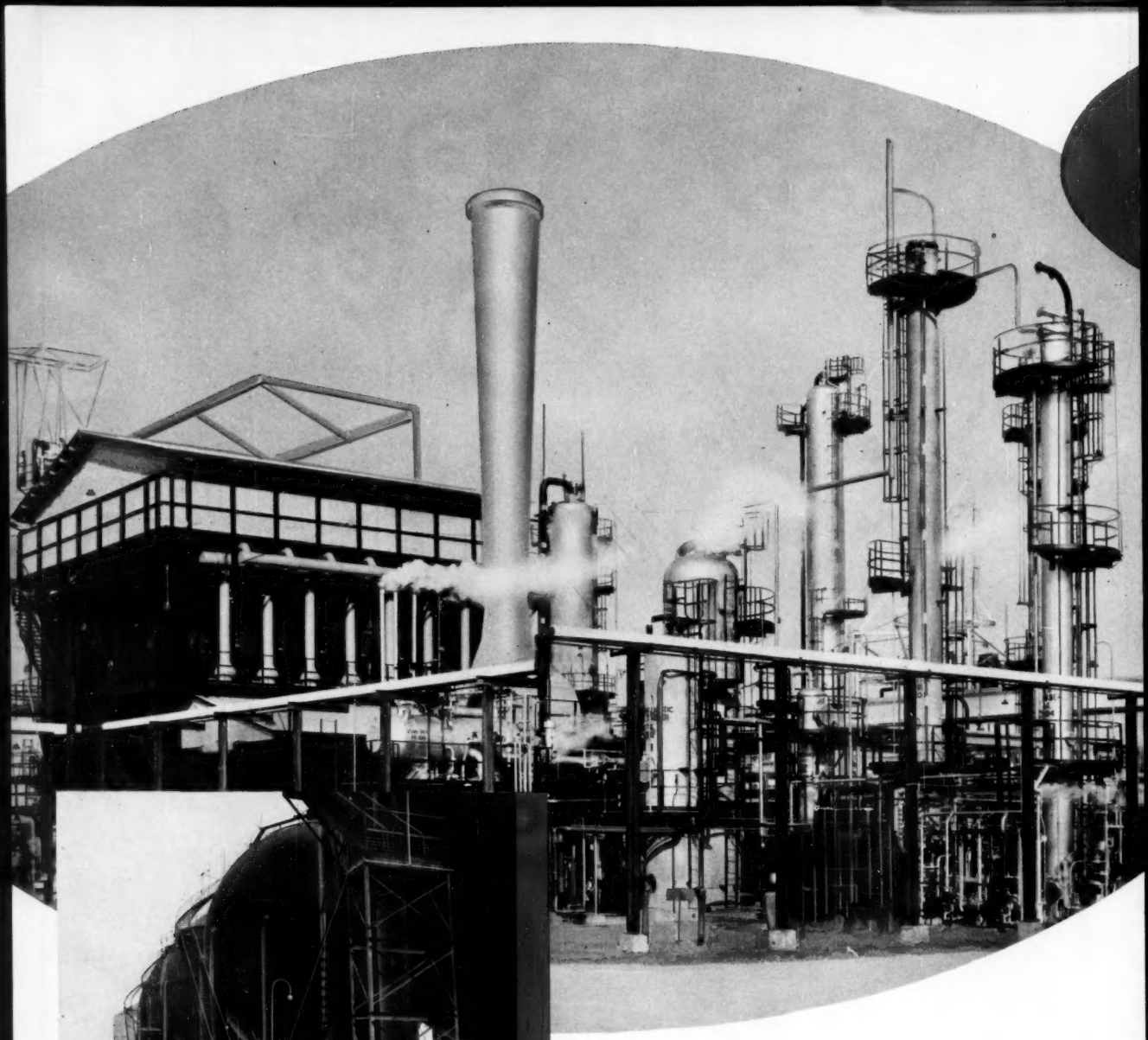


to utilize the complete facilities and superior service of Sohio's new plant at Lima, Ohio

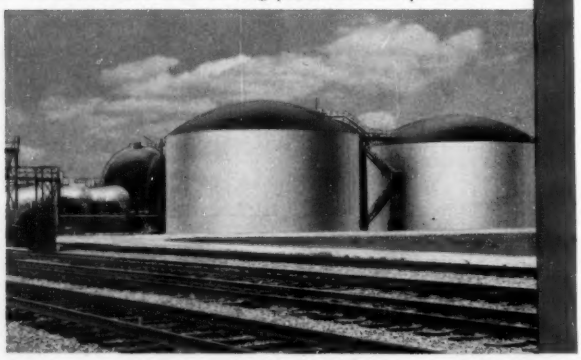
To bring this new plant into full production at this early date we worked 'round the clock . . . accomplished in weeks what normally requires months.

WE WANT TO BE INCLUDED IN YOUR 1956 PLANS! Here's your opportunity to acquire an efficient, dependable source for high-quality industrial chemicals.

- **ANHYDROUS AMMONIA**
  Refrigeration and commercial grades
- **AQUA AMMONIA** • **NITRIC ACID** • **UREA**
- **83% AMMONIUM NITRATE SOLUTION**



Ample anhydrous ammonia storage more than assures deliveries during peak demand periods.



Largest storage facilities in country in relation to production capacity.

DRAWING on the best available experience in the chemical industry, Sohio surveyed every known method of ammonia and urea production. Selecting the most efficient and reliable of processes to produce the highest quality products, the ultimate in a modern petrochemical plant was designed. No effort, no expense was spared. Users of industrial chemicals were questioned as to their product and delivery needs. Research and production departments were staffed with outstanding men. The new Sohio chemical plant at Lima is as perfect as men and materials can make it.

fast service

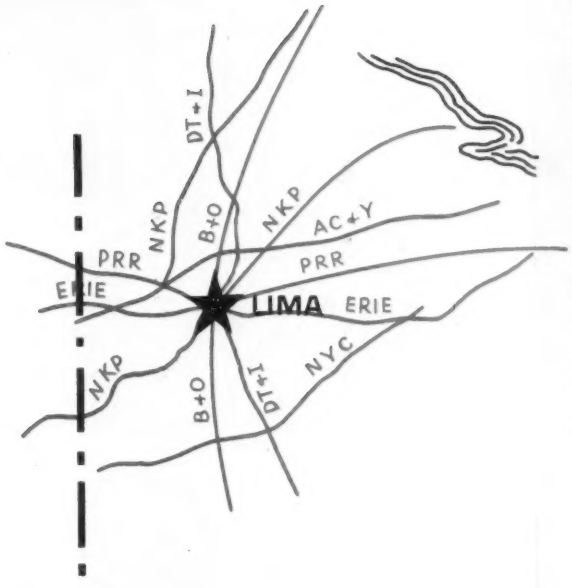
unmatched facilities

uniform high quality

Centrally located in America's industrial heartland, Sohio's Lima plant is served by five railroads:

NICKEL PLATE **BALTIMORE & OHIO** **ERIE**
PENNSYLVANIA **DETROIT, TOLEDO & IRONTON**

These lines offer ready transfer to connecting roads. In addition, two of them provide switching service inside the plant area, assuring you rapid rail service from Sohio's plant.



- Equipment and methods are the most modern among the thoroughly tested and proven processes.
- There is adequate provision for expansion.
- Uninterrupted operation is assured by multiple sources for natural gas, water, and electrical power.
- Downtime is minimized because of Sohio's integrated maintenance system.

One of the most important requisites for a plant in this market is its ability to meet extraordinary peak delivery requirements. Sohio's shipping and storage facilities are geared to these needs. For example, rail car loading capacity is *four* times productive capacity. In addition, Sohio's own trucks are ready to ship on relatively short notice.

Electronic Quality Control

pays dividends to Sohio customers

New electronic methods — unique systems never before used in this industry — maintain quality and production control at Sohio Chemical Company. Every phase of ammonia production is electronically scanned five times each minute and recorded by the Data Logger, an instrument originally perfected for the Atomic Energy Commission. Production and quality conditions are recapped hourly by the Data Logger and transmitted to IBM cards for continuing analysis by an "electronic brain." This assures uninterrupted high-quality production. Pictured here are other checks that continuously safeguard quality.

New stainless steel 4000-gallon nitric acid and 6800-gallon steel anhydrous ammonia tank trucks furnish regular delivery service within normal trucking area and twenty-four hour emergency service throughout distribution area. Excellent road facilities to all points.

Sohio's all-new fleet of high pressure steel anhydrous ammonia tank cars and stainless steel nitric acid tank cars are ready to serve you. Tank cars and tank trucks are equipped with the most modern devices including spring-loaded relief valves to meet your requirements for safer, quicker, more economical unloading.

fast service

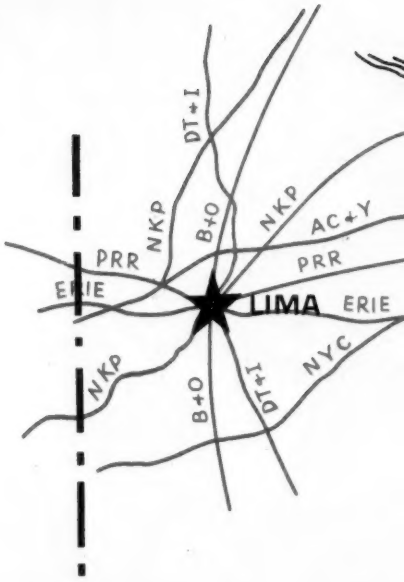
unmat… facili…

uniform high quality

Centrally located in America's industrial heartland, Sohio's Lima plant is served by five railroads:

NICKEL PLATE **BALTIMORE & OHIO** **ERIE**
PENNSYLVANIA **DETROIT, TOLEDO & IRONTON**

These lines offer ready transfer to connecting roads. In addition, two of them provide switching service inside the plant area, assuring you rapid rail service from Sohio's plant.



- Equipment and methods are the most modern among the thoroughly tested and proven processes.
- There is adequate provision for expansion.
- Uninterrupted operation is assured by multiple sources for natural gas, water, and electrical power.
- Downtime is minimized because of Sohio's integrated maintenance system.

One of the most important requisites for a plant in this market is its ability to meet extraordinary peak delivery requirements. Sohio's shipping and storage facilities are geared to these needs. For example, rail car loading capacity is *four* times productive capacity. In addition, Sohio's own trucks are ready to ship on relatively short notice.

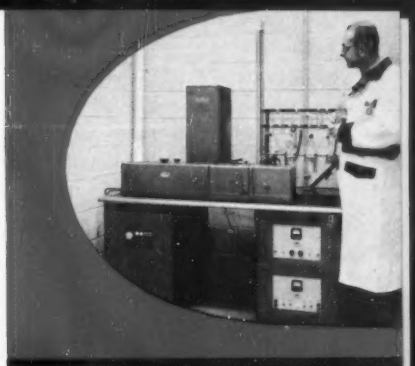
New stainless steel 4000-gallon nitric acid and 6800-g… anhydrous ammonia tank trucks furnish regular deliv… within normal trucking area and twenty-four hour emerg… throughout distribution area. Excellent road facilities to…

tched
ities

Electronic Quality Control

pays dividends to Sohio customers

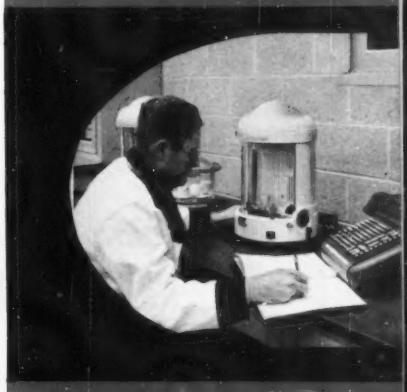
New electronic methods — unique systems never before used in this industry — maintain quality and production control at Sohio Chemical Company. Every phase of ammonia production is electronically scanned five times each minute and recorded by the Data Logger, an instrument originally perfected for the Atomic Energy Commission. Production and quality conditions are recapped hourly by the Data Logger and transmitted to IBM cards for continuing analysis by an "electronic brain." This assures uninterrupted high-quality production. Pictured here are other checks that continuously safeguard quality.



Infra-red Spectrophotometer analyzes the various process gas streams.

Kjeldahl rack used in determining nitrogen content of materials to make quantitative analysis.

Standardizing titration solutions for finished product analysis with the Titrometer.



Sartorius Balance is a high-speed instrument capable of accurately weighing analytical samples.

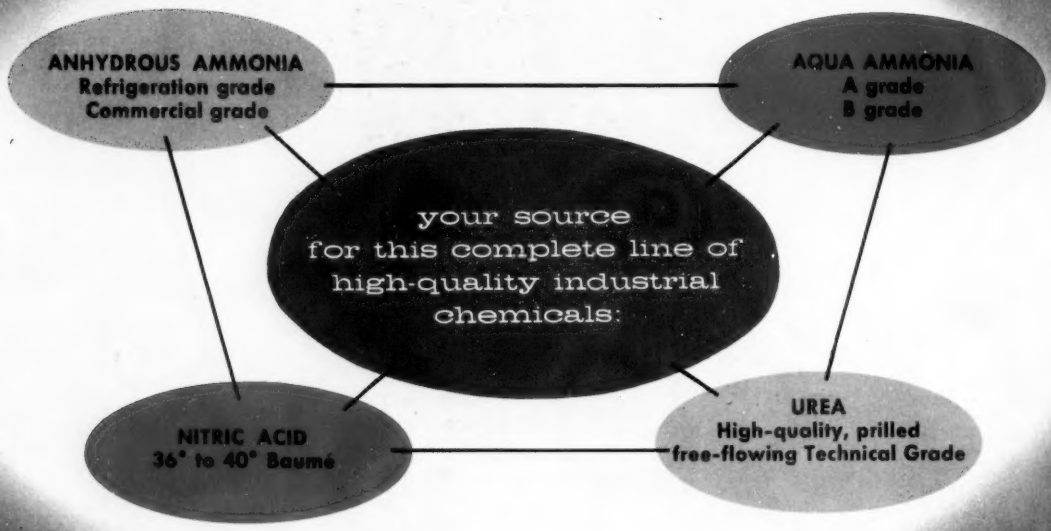
Mass Spectometer performs rapid and graphic electronic analysis of the process gases.

00-gallon steel
elivery service
ergency service
s to all points.

Sohio's all-new fleet of high pressure steel anhydrous ammonia tank cars and stainless steel nitric acid tank cars are ready to serve you. Tank cars and tank trucks are equipped with the most modern devices including spring-loaded relief valves to meet your requirements for safer, quicker, more economical unloading.

Sohio provides
GUARANTEED ANALYSIS
of each batch

Every tank car, every tank truck is checked before it is released to Sohio customers. This is your assurance of maintaining the quality of your own product.



TECHNICAL SERVICE AVAILABLE

- Capable technicians and engineers ready to serve you.
- Outstanding laboratory with staff experienced in petrochemical research.
- Qualified independent research organizations with specialized facilities are on call when required.

WE'RE ON STREAM, READY TO SERVE YOU

- Sample quantities for laboratory tests are available to you with no obligation on your part.
- Sales representatives will be happy to make a personal call at your firm to explore those areas in which we may be of service.
- Our complete facilities are at your disposal, ready to earn a place on your list of suppliers.

SOHIO

SOHIO CHEMICAL COMPANY

P. O. BOX 628

FT. AMANDA RD. • LIMA, OHIO

NO MATTER what they call it, melamine resin producers are . . .

Tagged for a Battle

The plastic dinnerware field—long dominated by two U.S. melamine producers, American Cyanamid and Allied's Barrett Division—will soon see some radical changes. Coming up: new government-sponsored quality standards for consumer ware; chinaware makers marketing plastic dishes; some new materials from Cyanamid and Allied; a rising challenge to the thermosetting plastics by improved thermoplastics.

Cyanamid, at present, is pushing Melmac, its registered trademark for "quality approved" melamine dinnerware, in a wide variety of promotion media. And molders, invited to tie in with Cyanamid ads, are reaping benefits from the public acceptance of the Melmac label as a standard of quality.

Behind Cyanamid's emphasis on the trademark, rather than on the molder's name, is an effort to prevent bad consumer reaction when inferior goods are palmed off by fly-by-night producers.

Because of this insistence on quality, Cyanamid has to watch some molders carefully. One instance, bruited about in the trade, is the case of the molder who made cups of melamine, but saucers of cheaper plastics and hung the Melmac label conspicuously from the cup.

Evidence that Cyanamid is interested in maintaining high standards in the dishware field is the now pending suit against Spaulding Industries (Chicago) for unauthorized use of the Melmac label.

Allied's approach is different than Cyanamid's. While also providing nationwide promotion with the opportunity for the molders to participate, Allied's emphasis is mostly on the brandname of the molder, less on the generic term "melamines." Unlike Cyanamid, however, Allied does not insist on adherence to any formalized quality standard.

A major reason for this attitude is that Allied believes the soon-due (probably in 4-5 months) government commercial standards for plastic dishware will adequately protect consumers from inferior goods. One way dishware buyers have been "taken" in the past: some plastics molders have used only a small amount of melamines in their dishes—enough to enable them to claim their wares are "fashioned" with the material, but certainly not enough to produce a quality melamine product.

Possibly an even stronger reason for the brandname approach is this: both Allied and Cyanamid are reportedly ready with some newer thermoplastic molding material, probably aceto guanamines. Use of these materials is said to provide even harder surfaces than the melamines, cut down staining and scratching—weak points of melamines. But, if molders switch over to new thermoplastics, a whole new promotion campaign on brandnames will be required.

China Stamp: Brandname emphasis will be further spotlighted when chinaware makers finally get into the plastic dinnerware market with melamines. (Among the first to take the long-contemplated step will be Gladding McBean, San Francisco, and Rosenthal Block, New York.) Chinaware producers have traditionally pushed their company names rather than the raw material. This may explain Allied's urging molders to get their own names before the public as dishware manufacturers rather than as plastic fabricators.

Cyanamid and Allied have been engaged in a toe-to-toe sales bout so long that they have given little thought to other likely challengers. Both refuse to concede that any of the new

Melamine Dishware Market

- **Now split 70-30 between American Cyanamid and Barrett Division (Allied).**
- **This year some 30-35 million lbs. of melamine molding compounds will be consumed in approximately 45 million pieces of institutional ware and about 60 million home dishware items.**
- **In '55, consumption of the compounds totaled about 24 million lbs., a hefty 35% increase over the previous year.**

thermoplastics* might have any merit as dinnerware materials, claim these won't be a serious threat to the 10% of the total dinnerware market now held by melamines.

The thermoplastics producers are not too upset by this rather cavalier dismissal of their product. Unawed by the champions, they'll soon climb into the sales arena for a free-for-all.

Streamline Shipping

Safety requirements for water shipments of chromic acid, chromic anhydride, chromium trioxide, chlorate and borate mixtures, chlorate and magnesium chloride mixtures and motor fuel antiknock compound have been changed by the Coast Guard.

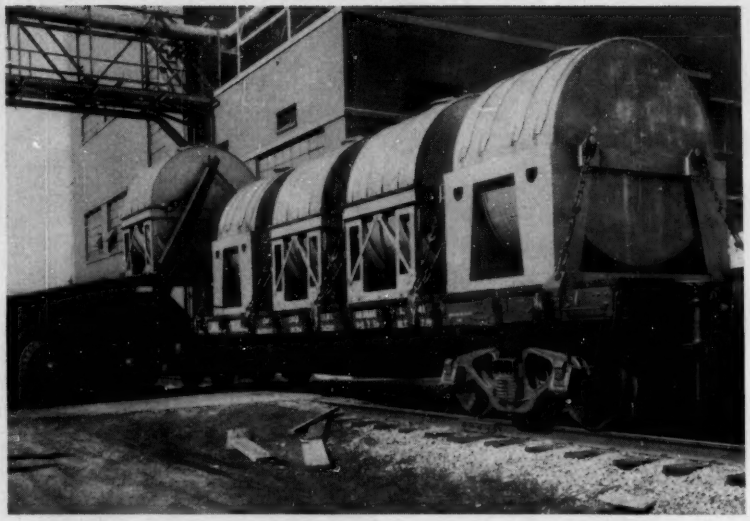
Under the new rules, chromic acid, chromic anhydride and chromium trioxide can now be carried in the upper part of the below-deck section of a ship's cargo hold if they are readily accessible. The Coast Guard had required that these be stowed above decks because of their hazardous qualities, and restrictions still prohibit stowage in lower holds.

For chlorate and borate mixtures, and chlorate and magnesium chloride mixtures, the Coast Guard cleared up a technical point by exempting these commodities from its safety regulations when such mixtures contain 25% or less chlorate and no other hazardous additives; previous regulations covered mixtures containing more than 25% chlorate or less than 25% chlorate, but did not cover mixtures containing exactly 25% chlorate.

Too, mixtures with less than 50% chlorate can now be shipped in multiwalled paper bags, not over 50 lbs. net weight; previously, such shipments had to be made in metal containers with no paper bag shipments allowed.

Finally, motor fuel antiknock compound in railroad tank cars can now be carried on all four deck levels of sea train-ships; previously it could only be carried on the two upper-deck levels. Sea Trains Lines, Inc. (New York) requested the change on grounds that in its type of operations, safety conditions are the same for all four decks.

*Probable thermoplastics challengers: Dow's Styrex 767, Bakelite's C-11, both styrene-acrylonitrile copolymers; Cyanamid's Cymac 201, a methylstyrene-acrylonitrile copolymer. Other possible contenders: low-pressure polyethylene—upcoming from Koppers, Phillips, Carbide, Kellogg, Celanese, Grace, and others—and irradiated polyethylene.



SUPERDRUMS: Lever delivers refined and blended vegetable oil, using . . .

Tank Cars by the Slice

Latest development in the trend to use of large containers has just been unveiled in Canada by Lever Brothers Ltd. The units, which look like thick slices of bologna sitting in strawberry boxes, are used to transport refined and blended vegetable oils from Toronto to Lever's Newfoundland Margarine Co., Ltd., plant at St. John's Newfoundland.

Over-all height of the aluminum unit (it hasn't yet been christened) is 8 ft. 11 in., including filling dome and steel cradle. Five units sit on a flat car, specially fitted with female castings to accommodate four steel casters of the container cradles. This helps relieve strain in movement and reinforces the support offered by chain tie-downs.

Special feature of the containers, which ruled out use of existing large units—such as Tote Bins, is the incorporation of heating coils in container body.

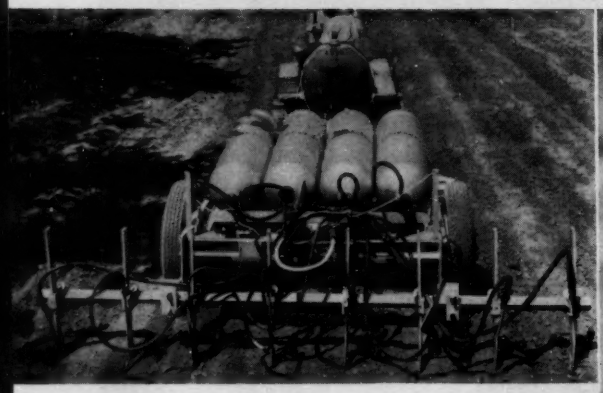
Route for the containers: by rail from Toronto to North Sidney, Nova Scotia, where they are transferred to ferries by railway cranes; by ferry to the west coast of Newfoundland for transfer to rail for the trip to St. John's, where they're unloaded and transported on hydraulic-lift-equipped trucks to the plant.

The obviously simpler method, shipping all the way by tank car, isn't possible. There's no railroad ferry service from Nova Scotia to Newfoundland; the provinces use different gauge railroads; the plant at St. John's has no rail siding.

Use of the containers replaces the previous method of shipping 400-lb. returnable drums by boat from Toronto during a 7-month shipping season, or by rail to Montreal or Halifax for reshipment by boat. New routing allows year-round shipment, eliminates intermediate storage of drums, necessity of scheduling shipments to coincide with steamship sailings.

While railway rates are still being negotiated with the Canadian National Railways, CNR will probably charge by weight. Two flat cars are now in operation on a trial basis. When the full program gets under way, 3 cars will move out of Toronto each week, requiring 30 containers and 16 of the special flat cars (10 on the mainland, 6 on Newfoundland). There's a charge for return shipments of the empties, but chances are that a deal involving return shipments of whale oil will be arranged.

Lever's transportation and supply manager, W. J. Rae, says that it's too early to forecast savings effected, but adds that "the projected returns from the operation are quite sufficient to justify the required capital expenditure."



GROWING OLD: Anhydrous ammonia is losing the glamor of newness at its growth rate slows to mature level.

GROWING UP: Solution plant food sellers are cashing in on attraction of an unfamiliar product as . . .

New Fields Beckon Fluid Fertilizers

With farm chemical sales slumping generally this year, fertilizer manufacturers are watching hopefully several materials that appear to be bucking the downtrend. Consumption of fertilizer solutions and anhydrous ammonia, to name two, seems destined to be greater in the 1955-56 crop year than in the previous period. Anhydrous may just squeak through to a new peak, but fluid fertilizers will score impressive gains. And that would be welcome news to the ammonia industry, which is struggling with oversupply.

Today, U.S. annual nitrogen capacity is some 3.6 million short tons, and that's heading for close to a 4.4-million-tons potential by the '59-'60 season.

With the exception of California, meaningful and precise figures on use of anhydrous and solution fertilizers are not yet available. But comments from government officials and industry leaders, plus current development, point to a bright future for fluid fertilizers.

An over-all consumption breakdown* (*see box*) shows that solution fertilizers have been booming, while anhydrous sales appear to be leveling. For the 1953-54 period, use of solutions approximated 219,000 short tons; anhydrous use, 350,000 tons. Last year, anhydrous climbed to 354,000 tons as fluids shot up to about 398,000 tons.

Growth in use of solutions on the West Coast (particularly in California) continues to be rapid. But although California is the principal using area,

PATTERN OF CONSUMPTION IN UNITED STATES

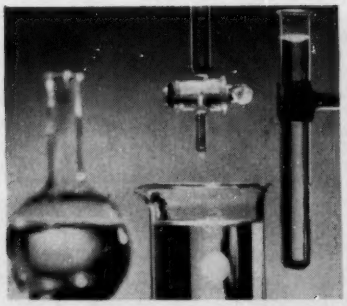
Direct application, short tons	1950-51	1951-52	1952-53	1953-54	1954-55
Anhydrous ammonia	118,423	168,273		350,474	354,000
Aqua ammonia	17,659	20,026	reported	only as nitrogen	solutions
Nitrogen solutions (includes aqua ammonia)	34,493	42,204	72,917	191,592	341,000
Liquid mixed fertilizers	—	—	—	27,548	53,000*
Mixed fertilizers	13,978,382	15,086,349	15,722,224	15,541,076	15,348,000

IN CALIFORNIA ONLY

Direct application, short tons	1953-54	1954-55	1955-56	1955 1st quarter	1956 1st quarter
Anhydrous ammonia	49,000	52,305	64,470*	11,060	12,904
Aqua ammonia	76,439	149,666	213,000*	29,831	39,758
Nitrogen solutions (excluding aqua ammonia)	16,517	19,933	—	3,681	5,058
Liquid mixed fert.	20,564	31,580	—	5,353	8,117
Mixed dry fert.	200,610	208,681	—	67,334	61,494

*estimate

*Based largely on data compiled by the Division of Fertilizer and Agricultural Lime, U.S. Dept. of Agriculture, Beltsville, Md.



Important in the synthesis of dyes and pharmaceuticals . . .

DOW phenylhydrazine

may be the intermediate you need to improve your product

Primarily, phenylhydrazine has been used as an intermediate in the manufacture of dyestuffs and pharmaceuticals. Its list of other applications is growing.

It can be a good starting point for the manufacture of many chemicals in a variety of fields. Using it in your synthesis may prove profitable to you!

Dow phenylhydrazine is uniform as the minimum assay of 97% and many years' experience guarantee. And you can always depend on a ready supply and prompt delivery according to your needs. Write today for further information and a test sample. Evaluation now may be your next step to product improvement, lower costs! THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. FC 882B.

you can depend on DOW CHEMICALS

DOW

the East North Central and West North Central states are expected to post large gains this year. Sinclair, Sohio, Spencer and Allied are all promoting solution types. In Ohio alone, several liquid formulating plants have been added in the past year. And in Indiana, Davison Chemical is starting up a large, 15-tons/hour liquid mixed fertilizer plant.

The South—long the stronghold of anhydrous ammonia—is also witnessing greater interest in solutions. Consumption in Georgia last year doubled the previous year's figure and state officials believe liquids are "definitely gaining wider acceptance." Florida, too, is apparently following the solution van, but the liquids have not caught on in the Northeast to any great extent.

Although some quarters feel that part of the growth in use of solutions is at the expense of anhydrous, consumption of the latter is still expanding, particularly in California.

Sales in the South this year, one observer estimates, will be 6-8% above last year's. Compare this with the Agricultural Ammonia Institute's estimate that the national anhydrous consumption can expand to an ultimate 30-40% share of the total nitrogen market. Present share: 15-20%.

Biggest trump card for anhydrous is that it is the cheapest per-pound-of-nitrogen fertilizer. For that reason, several major companies are banking on anhydrous for the long run. This optimism is qualified, however: anhydrous growth will not be as fast as it has been in the past, they say.

Mixture Picture: Consumption of mixtures seems to be tapering off. California resisted the slide, now appears to be using smaller amounts of solid materials (*see box, p. 60*).

Although total tonnage sales of fertilizer is calculated to be smaller in the current '55-'56 crop season, sales on a nutrient basis will probably remain constant. Reason: a trend to higher-nutrient-content materials.

Liquid mixture sales are expected to mount sharply in the East North Central states and on the West Coast. Some 100 plants are reported built or building in the Midwest (*CW, Jan. 21, p. 84*).

The fate of liquids will be linked with the supply of quality phosphoric acid at suitable prices. Several companies are researching ways to use the less expensive "wet" process acid. Furnace-type producers may be attracted.

Behind the Shuffle: Reasons for the fast rise of solution fertilization and the slowing growth of anhydrous center on these points:

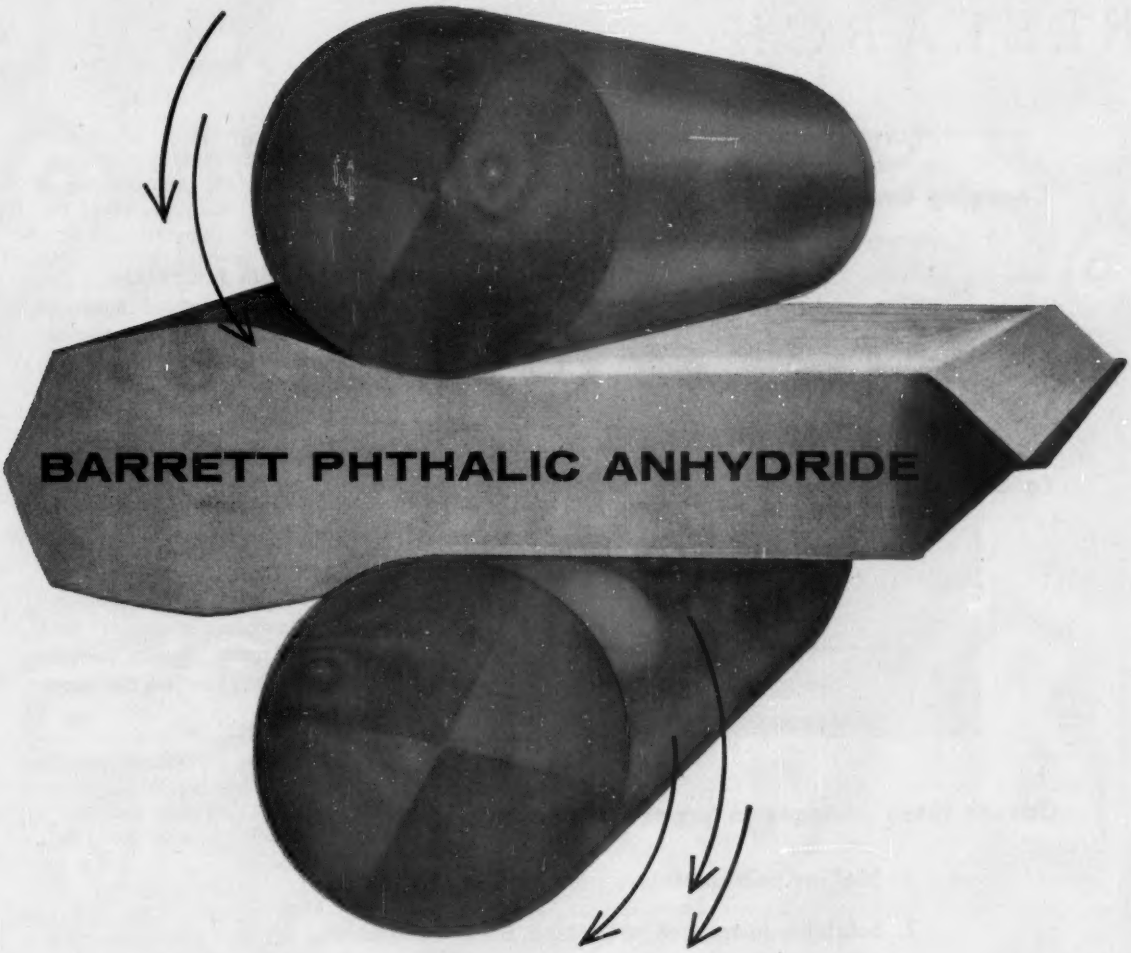
- Newness. Aqua ammonia, nitrogen solutions and liquid mixtures command attention because of their newness relative to anhydrous and solids.
- Promotion. Extensive promotional campaigns on behalf of solutions (particularly by Allied) have aroused farmer interest. And Allied has been putting up storage tanks for local distributors.
- Geography and climate. In areas where fluids are gaining most, suitable soil and weather conditions prevail.
- Distribution. Storage facilities, transportation and application equipment is considerably less expensive for liquid materials than for anhydrous. Thus, the dealer is inclined to have enough equipment on hand to service peak-season loads. Application, too, is regarded as easier and less hazardous.

On the other hand, corrosion problems are less severe with anhydrous, and it can be sold in areas remote from the manufacturing point. High cost of water transportation limits liquid distribution to the vicinity of the formulation location.

Ahead: Outcome of current trends is clouded by uncertainties. Example: the new soil bank law will likely lead to intensive cultivation and higher nutrient consumption per acre. But this fertilizer may be diverted from land now "in the bank."

For such reasons, several of the larger producers are gearing to sell all types. Feeling is rising that there's definite places for anhydrous solutions and liquid mixes in the market. Said one company: "Selling nitrogen is the main thing—the type is secondary." Smaller concerns, however, may not be able to follow this tack—costs of duplicating distribution facilities are beyond their reach.

Despite this "fertilizer family" approach, however, look for more intensive educational campaigns on behalf of anhydrous ammonia next year. Aim: to convince farmers that anhydrous is cheapest, is safe if properly applied. If farm income plummets further, low-analysis mixed fertilizers may stage a comeback.



"KNEADED" FOR YOUR SAVINGS...

each and every bag of Barrett phthalic

This little matter of "kneading"—or flattening—of Barrett bags can mean important savings in your handling and storing operations. Kneading produces a more regular and compact bag shape. That's why Barrett bags are more easily stacked on pallets... less likely to break apart in handling.

You'll save time and storage space with the kneaded Barrett bag. At the same time, you'll enjoy these other advantages of dealing with Barrett:

- Ample supply from world's largest phthalic producer
- Convenient locations of four separate phthalic plants
- Technical service staff backed by modern laboratories reserved for your problems.

Let your Barrett representative tell you more about Barrett Phthalic Anhydride.

BARRETT CHEMICALS

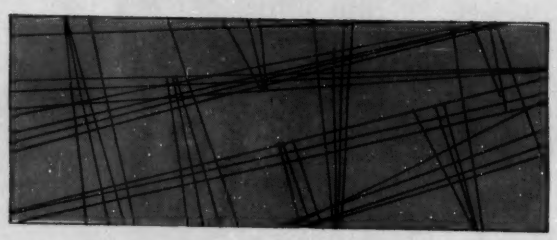
BARRETT DIVISION, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N.Y. In Canada: The Barrett Company, Ltd., 5551 St. Hubert Street, Montreal, Que.

Allied Chemical

WORLD'S LARGEST PRODUCER OF PHTHALIC ANHYDRIDE

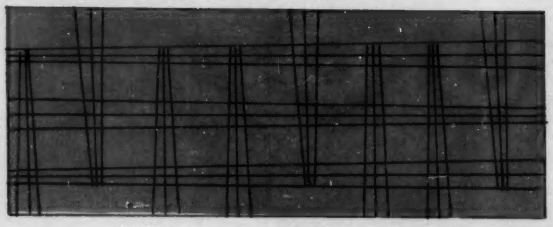
ORIENTATION UPGRADES POLYPROPYLENE FIBER

Changing unoriented polymer . . .



AMORPHOUS POLYMER: Random arrangement of molecules does not allow binding effect of intermolecular forces to come into play. Result: polymer is loosely packed, weak.

To an ordered state . . .



ISOTACTIC POLYMER: Molecules are in orderly arrangement; intermolecular forces bind molecules together. Result: polymer that is denser, less soluble, more heat-resistant.

Causes these changes in properties:

1. Melting point increases from 75 C to 158-170 C.
2. Solubility in toluene, n-heptane, ether decreases.
3. Specific gravity increases from 0.85 to 0.92.

And—Raw Materials Cost Pennies / Pound

Isotactic polyolefins (e.g., polypropylene, polybutylene) are highly oriented, crystalline editions of the ordinary members of their species. But the difference between isotactic polyolefins and their prosaic cousins is perhaps best summed up this way: isotactic polymers are better. They have higher melting points, better solvent resistance, are superior in any number of ways. Combine this with their high tensile strength—greater than that of nylon or the acrylics—and you have a fair idea of why isotactic polymers are today the hot properties of synthetic fiber researchers.

Both here and abroad, these workers are launching a broad-scale attempt to fit isotactic polymers to specific fiber applications, capitalize on the polymers' outstanding attribute—the low cost of the materials from which they are made.

Both propylene and butylene—typical starting materials—are cheap and abundant. It is difficult to assign costs to such items, but propylene could probably be charged to a chemical process for 1-2¢/lb., butylene for 3-7¢/lb.

Right now, such costs are largely conjectural; much still depends on what will happen in the development of polymerization techniques, catalysts and fiber manufacturing methods. But the conjectures are based on assumptions sound enough to have nailed the interest of such notable polymer researchers as Italy's Giulio Natta (Milan Polytechnic Institute) and Germany's Karl Ziegler; sparked studies at Standard Oil of Indiana (Whiting, Ind.), Phillips Petroleum (Bartlesville, Okla.), and other U.S. concerns.

Just last week, Natta discussed isotactic polyolefins at a session in New York's Chemists' Club. Presumably he will have more to say on the subject at the upcoming Gordon Research Conferences.

Standard reveals it has made isotactic polymers of propylene (its process patent on polypropylene is U.S. 2,692,257), demonstrated their crystalline structure, found physical properties that agree with Natta's findings.

Phillips, now gearing to produce its linear polyethylene, Marlex 50, by fall, avers that its experimental polypropylene polymers and copolymers have interesting properties but that it is too soon to make significant compari-

sons. It is also too early to talk textile properties. A firm that spins fibers from polyethylene—amorphous forerunner of the isotactics—Reeves Bros. (New York) declares: "We're all very much interested in these fibers. But until we see some, we can't evaluate them."

Dye Hard: At least one word of caution issues from John Dillon, director of the Textile Research Institute (Princeton, N.J.). Dillon points out that the new fibers are hydrophobic, will be joining an already crowded group of hard-to-dye fibers.

Asserts Dillon: "Nowadays the first thing to look at is colorability; other fiber properties come second. There are good reasons for using hydrophobic fibers, but if I were trying to develop another one, I'd try to make it no more hydrophobic than the ones we've got—or at least not as difficult to dye."

Spin Solution: Isotactic enthusiasts think that the coloring problem might be overcome by spin dyeing—whereby the fibers are melted and mixed with pigment that colors the fiber throughout.

(Dillon also points out that there may be a big discrepancy between a fiber's raw material cost and its final cost—for example, in the case of cellulose pulp when it's converted into fine-denier viscose.)

How Isotactic Polypropylene Stacks Up Against Other Fibers

	Ultimate Tensile Strength (psi.)[1]	Tenacity[2] (grams/denier)	Elongation[3] (percent)	Density grams/cc.
Isotactic polypropylene	110,000	9.3	31	0.92
Polyethylene (regular)	23,000	2.0*	50 (oriented) 650 (unoriented)	0.92
Nylon (regular)	76,000	5.2	29	1.14
Nylon (high-tenacity)	98,000	6.8	22	1.14
Viscose (regular)	37,000	2.0	27	1.51
Viscose (high-tenacity)	73,000	3.8	18	1.51
Acetate	25,000	1.4	27	1.32
Orlon	66,000	4.5	16	1.15
Dacron	84,000	4.8	21	1.38
Glass	212,000	6.6	3	2.54
Steel	299,000	3.0	8	7.80

(1) Breaking strength of a bundle of fibers under longitudinal tension.
(2) Breaking strength of a single fiber under longitudinal tension.
(3) The extension (in the direction of load) of a fiber, caused by a tensile force, expressed as a percentage of original length.
*Estimates place value of high-tenacity polyethylene at 5 to 9.

NATTA: IN SPIRALING SIDE CHAINS, A NEW TWIST FOR FIBERS.

But these other drawbacks of the fibers are conceded:

- Despite the improved melt properties, they are still way below nylon in melting point (428 F for nylon vs. about 300 F for polypropylene). This means extreme care must be taken in ironing or heat-treating the fibers.
- Light stability is reportedly poor (ultraviolet light quickly decomposes them).
- Because they have excellent electrical resistance, they're likely to build up static, a handicap in textile processing.
- Yields of isotactic polymers are low according to all the literature that has been published. (Natta, however, now indicates that his techniques are vastly superior to anything that has been published.)

Big If: If they can be brought through to commercialization, the fibers should find plenty of uses where strength or inertness is required. Examples: rope, filter cloths, seat covers and furniture fabrics.

Whether they'll find their way into other applications depends, paradoxically, on how much their properties can be improved. Standard of Indiana reports:

"Because these synthetic fibers are low-melters, difficult to dye, there is some question whether they will have application in fields typical of those entered by nylon.

"And, since they have reached molecular weights where the melting point curve has flattened out, increasing the molecular weight does not increase melting point. For some uses, this will be a disadvantage. An example is tire cords where high tensile strength would otherwise be very useful."

Although Natta very pointedly doesn't disclose how he prepared the fibers, it's a good bet they were hot-melt spun (extruded). That's because

the polymers aren't dissolved by ordinary solvents.

Matter of Definition: Isotactic is a word coined by Natta to describe his crystalline polymers, in which the molecules are highly oriented. These polymers are of the basic formula $-CH_2-CHR-CH_2-CHR-CH_2-CHR-$, in which alkyl groups are oriented with respect to the asymetric carbons.

These side groups spiral around the main chain, and the spirals fit closely together to give a regular crystalline structure. In contrast, the amorphous type of polymer—as made by high-pressure polymerization techniques—has random arrangement of side groups. This prevents close packing and crystalline orientation (*see p. 64*).

Polyethylene, by Natta's definition, is not an isotactic polymer, because it lacks R groups.

Natta makes his polymers with heterogeneous catalysts that fall in the broad category of metal-alkyls, metal halides. And depending on the structure of the catalyst, he reports, different amounts (from 0-100%) of the polymerization products are crystallizable, can be separated from the much more soluble noncrystalline polymers by solvents.

Right now, this process appears to be attractive enough to have captured the interest of U. S. chemical companies interested in fibers and plastics, as well.

DILLON: 'MAKE IT NO MORE HYDROPHOBIC THAN THE ONES WE'VE GOT.'

WIDE WORLD

O'MAHONEY: Big plans for the Patent Office.

20-Year Patent Coming?

Bills now being considered by Congress are aimed at overhauling the patent system.

Here's what they'll do, what the outlook is for their passage, and what they mean to the chemical industry.

TWO PATENT BILLS awaiting a Senate hearing merit close attention by chemical firms. The proposed legislation would:

- Set up a single court of patent appeals.
- Limit the life of a patent to a maximum of 20 years from the date of filing the application, or 17 years from the patent's date of issuance—whichever is shorter.

But the bills reflect only part of the activity brewing in Sen. Joseph O'Mahoney's (D., Wyo.) Patent subcommittee. In hiring a new chief counsel, Marcus Hollabaugh (long-time antitrust patent expert, formerly with the Justice Dept.), O'Mahoney has led some observers to believe he may be more interested in the antitrust aspects of the patent system than in a general evaluation of how it is working. (Besides the bills already presented, his staff is drafting others that seem sure to arouse controversy—e.g., one to avoid concentration of unused patents in large companies.)

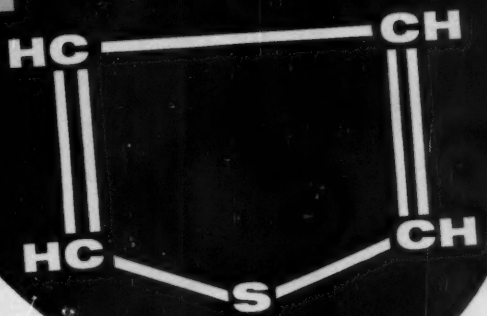
O'Mahoney says he believes the patent system would be greatly improved if a single court of patent appeals were established. Under the present system, appeals from decisions of the district court go first to the U.S. Court of Customs and Patent Appeals.

The new bill is designed to create a court that would receive and decide appeals from the patent office—as well as appeals from all of the district courts—in patent cases.

Such a system as O'Mahoney sees it, is badly needed to provide a more uniform standard of invention and greater consistency in judicial decisions relating to patents. He also wants interested parties to consider the desirability of making the new court, if created, a court of last resort—to cut off any appeals to the U.S. Supreme Court. O'Mahoney notes that the record of the Supreme Court in

Sharples

Thiophene



A versatile intermediate..

available in tank cars...

Through the new Sharples plant and its stream-lined facilities, Thiophene is now available, in drum or tank car quantities, in a *continuous and dependable supply.*

As a highly reactive intermediate, Thiophene has an established pharmaceutical use in the manufacture of antihistamines. Some of its derivatives have shown significant activity as local anaesthetics, pressor compounds, hypnotics, analgesics, antispasmodics, anticonvulsants and chemotherapeutic agents. Many of these derivatives have pharmacological effects markedly different from the benzene analogs.

Thiophene may be the "starting point" you are looking for to manufacture the new products with the particular characteristics you want. Call or write today for the Thiophene booklet. Samples, also, are forwarded promptly.

Other Sharples Organic Sulfur Compounds

Methyl Mercaptan
Ethyl Mercaptan
tert-Dodecyl Mercaptan
Dimethyl Sulfide
Diethyl Sulfide

Pennsalt Chemicals

SHARPLES CHEMICALS Division
PENNSYLVANIA SALT MANUFACTURING COMPANY
500 Fifth Ave., New York • 80 E. Jackson Boulevard, Chicago • 106 S. Main St., Akron
Executive Office: Philadelphia, Pa.
Martin, Hoyt & Milne Inc., San Francisco • Los Angeles • Seattle • Portland
Shawinigan Chemicals, Ltd.: Montreal • Toronto
Airco Company International, New York

overthrowing patents has been "rather remarkable."

Backlog Action: In the 20-year bill, O'Mahoney is introducing legislation similar to that passed by the Senate in 1941. The bill is designed to speed up the prosecution of patent applications, help erase the backlog of over 200,000 pending applications.

The interval between filing of applications and issuance of patents now averages 3½ to 4 years. Reasons: insufficient staff and funds at the Patent Office*; and a classification system (now being improved) that makes for slow literature searching.

But some delays are caused by applicants who thereby seek to extend the 17-year patent monopoly given under the law. Stalling of patent applications—for more than 20 years in some cases—is not unknown. But it's likely that most chemical firms would favor the 20-year bill if the Patent Office would speed up application processing.

Psychological Pressure: O'Mahoney points out that steps are being taken to improve the Patent Office's finances, cites the agency's record $17-million budget for fiscal 1957. And he feels that the 20-year bill would put psychological pressure on both the Patent Office and the applicants to get applications processed as fast as possible.

The bill would not affect any application that should come to final action in the Patent Office within three years of filing. Should the processing go beyond three years, however, the bill would apply the 20-year limit as of the date of filing the application. Safeguards are provided to prevent a curtailment of the term of the patent if delays are not the fault of the applicant, but result from Patent Office failures.

No hearings** have been held on either bill, but O'Mahoney is scheduling them. He hopes that introduction of the bills will focus attention on the problems, thus provide the basis for hearings at which industry experts can offer their ideas and experience.

Thus, whether or not the bills be-

*The Patent Office is currently building up its examining corps, expects to have 1,050 examiner assistants by 1958. It now has 610.

**Meanwhile O'Mahoney's Patent subcommittee is holding hearings this week on H.R. 2383 (passed by the House), the so-called "Inventive Contributions Award Act," which would authorize the Defense Dept. to pay awards to people who turn in useful ideas to the armed forces; and on H.R. 2128, the Patent Extension Act, which would authorize extension of patents covering inventions where use is curtailed or prevented by wartime production controls or by service of the patent owner in the armed forces.

SPECIAL PROFIT AND SUPPLY ADVANTAGES FOR CHEMICAL PROCESSORS

Michigan Chemical Corporation has twenty years' experience in the research and production of Bromine, Magnesia, Chloride, and Calcium chemicals. This background provides users with a dependable source of quality chemicals made right and priced right; our plants are large enough to provide quantity shipments for practically all purposes. Insure continuity of your operations: order from Michigan Chemical.

On requirements for special products (i.e., intermediates) consider us. We can move fast, efficiently, and price-competitively on your needs.

Aluminum Bromide Anhydrous. Technical grade, dark colored product suitable for most manufacturing uses. Highly reactive catalyst, many uses in organic synthesis especially in isomerization, bromination and halogen exchange reactions. Available as solid or lump.

Ammonium Bromide NF IX. A white powder, very pure, complies with all the requirements of the National Formulary. Commonly used as sedative in pharmaceutical preparations. Also in photography, textile finishing and as fire retardant for fabrics.

Bromine, Dry. A powerful oxidizing and brominating agent used in manufacture of dyes, pharmaceuticals. Many applications in organic synthesis. Low moisture content of 30 ppm permits use in nickel and monel equipment. Very irritating to skin, eyes.

Bromodichloromethane. A clear, heavy, volatile liquid with a chloroform-like odor. Specific gravity 1.99; boiling point 90 degrees C. Soluble or miscible with many organic liquids. Used in organic synthesis. Adds to olefins under the influence of peroxide catalysts.

Bromotrichloromethane. A clear, colorless, heavy liquid with a chloroform-like odor. Specific gravity 2.0; boiling point 104 degrees C. Miscible with many organic liquids. Useful in organic synthesis, forming adducts with olefins with peroxide catalysts.

Chlorobromomethane "CB". A specially prepared pure, non-corrosive fire extinguishing fluid. Now finding increased use in factories, warehouses, homes. Clear, colorless, 2 degrees C. boiling range; complies with current military specifications. Used as solvent and in organic synthesis.

Cyclopentyl Bromide. A clear, colorless liquid with an aromatic odor. Specially prepared for use in organic synthesis, particularly for introduction of the cyclopentyl radical. Many potential uses in manufacture of pharmaceuticals. Purified grade, 2 degrees C. boiling range.

Dibromochloromethane. A clear, colorless, heavy liquid similar to bromodichloromethane. Used in organic synthesis, forming adducts with olefins under the influence of peroxide catalysts. Specific gravity 2.38; boiling point 116 degrees C.

β - Diethylaminoethyl Chloride Hydrochloride. $(CH_3CH_2)_2NCH_2CH_2Cl \cdot HCl$ (DEC). A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including antispasmodic agents and other pharmaceuticals.

β - Dimethylaminoethyl Chloride Hydrochloride. (DMC). $(CH_3)_2 NCH_2CH_2Cl \cdot HCl$. A granular solid. Specially prepared for use in manufacture of antihistaminics and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in hydrochloride form.

β - Dimethylaminoisopropyl Chloride Hydrochloride. $(CH_3)_2NCH_2CHClCH_3 \cdot HCl$. (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.

γ - Dimethylaminopropyl Chloride Hydrochloride. $(CH_3)_2 NCH_2CH_2CH_2Cl \cdot HCl$. (DMPC). A white powder of singular purity. A versatile intermediate for pharmaceutical and organic syntheses, available exclusively from Michigan Chemical.

Ethyl Bromide. A clear, colorless, volatile liquid, specially prepared for use as an intermediate in organic synthesis. Practically free from impurities; has a narrow boiling range. Used in manufacture of dyes, perfumes and pharmaceuticals.

Hydrobromic Acid. A clear, colorless or light amber colored fuming liquid. Used for manufacture of inorganic metal bromides, aliphatic bromides, pharmaceuticals, dyes and intermediates. 48% acid and other strengths.

Magnesium Carbonate, Basic, Technical. Fine, uniform white powder, 325 mesh, bulk density 5.5 pounds per cubic foot. Very reactive. Used for rubber compounding, printing inks, paints, varnishes. Anti-caking agent for table salt; conditioning or bulking material for powder formulations.

Magnesium Hydroxide. Fine, white powder, typical assay 96.3%, low in moisture, iron, alumina, silica. Technical and NF IX grades. Special bulk densities available in NF grade. Convenient material for manufacture of light magnesias, other magnesium compounds.

Magnesium Oxides. Six principal grades of Michigan magnesium oxide with wide range of desirable physical and chemical characteristics covering principal uses of MgO, including rubber compounding, rayon manufacture, ceramics, glass, refractories, insulation.

Methyl Bromide. A heavy, colorless liquid, vaporizing at 40 degrees F., non-flammable and poisonous. Highly penetrating and insecticidally effective fumigant. Also used in organic synthesis for the introduction of the methyl group, especially in preparation of certain pharmaceutical chemicals.

Methylene Bromide. A clear, colorless liquid. Miscible with methyl alcohol, ether, chloroform and other organic liquids. A purified product with a 1.8 degrees C. boiling range. Specific gravity 2.47. Used in organic synthesis, as solvent and heavy gauge liquid.

Monobromobenzene. Clear, colorless, heavy liquid. Specially prepared for use as an intermediate in preparation of organic compounds. For introduction of the phenyl radical and in Grignard-type reactions. A pure material with a 4 degrees C. boiling range; specific gravity 1.495.

Phosphorous Tribromide. Brominating agent. A liquid, boiling point 173 degrees C., which fumes in contact with moist air. Used in synthetic work to convert alcohols to bromides, and acids to acyl bromides. Specially useful in preparation of bromides from alcohols without rearrangement.

Potassium Bromate, Granular. A fine, white, granular or crystalline material 99.5% pure. Decomposes at 370 degrees C. with evolution of oxygen. Strong oxidizing agent, used as an analytical reagent. Neutralizer in permanent wave compounds.

Potassium Bromate, Powder. A fine uniform powder with same properties as Granular. Available with added magnesium carbonate conditioning agent when specified. Suitable for use as an aging additive for flour.

Potassium Bromide, U.S.P. XIV. Pure, white granular powder. Low in chloride, passes all U.S.P. requirements. Widely used in the preparation of photographic emulsions, and in lithography. One of the most important sedatives. Available in several granulations.

Sodium Bromide, U.S.P. XIV. Pure, white crystalline powder or granules. Passes all requirements of the U.S. Pharmacopoeia. High assay; low in chloride. An important nerve sedative. Used in manufacture of other bromides. Contains about 77.5% bromine.

Trimethylene Chlorobromide. Clear, colorless liquid used in manufacture of anesthetic grade cyclopropane. Greater reactivity of bromine atom makes trimethylene chlorobromide specially useful also in preparation of gamma chloro compounds. Boiling range 2 degrees C. maximum.

Zinc Bromide Solution, Optical Grade. Clear, colorless solution, about 80% $ZnBr_2$. Used in laboratories dealing with radioactive chemicals as a radiation viewing shield; the most satisfactory material. Meets all chemical and optical specifications of Argonne National Laboratory.

Also manufacturer of Pestmaster Insecticides, Pestmaster* Methyl Bromide Fumigant and Dustmaster* Road Chemicals.*

MICHIGAN CHEMICAL CORPORATION

502 Bankson St., Saint Louis, Michigan

EASTERN SALES OFFICE: 230 Park Avenue, New York 17, New York

BASIC MANUFACTURER OF INDUSTRIAL, PHARMACEUTICAL AND AGRICULTURAL CHEMICALS

**Trademark

*Reg. U.S. Pat. Off.

C 55-2

RESEARCH

come law, the hearings should give the chemical industry an ideal vehicle to carry its case before the lawmakers.

PRODUCTS

Rare Earths: Research Chemicals, Inc. (Burbank, Calif.), a subsidiary of Nuclear Corp. of America, Inc., now offers a complete line of rare-earth oxides and salts in a specified purity range of 98-99.9%. The selection includes oxides and salts of lanthenum to lutecium (atomic numbers 57-71), which are available for immediate delivery. High-purity salts of hafnium, tantalum, columbium, rubidium and cesium are also offered.

•

Softener: Cyanatex SB-100, a new textile softener identified as a synthesized ester derivative of sulfosuccinic acid, is now in semicommercial production at American Cyanamid's Bridgeville, Pa., plant. Developed at the firm's Stamford, Conn., laboratories, the compound features high resistance to discoloration on aging, may be used on synthetic or natural fibers, reportedly requires very low concentrations to impart maximum softness.

REPORTS

These new government chemical research reports are available from the Office of Technical Service, U.S. Commerce Dept., Washington 25, D. C.

• "Spectophotometric - Cuprethol Method for the Quantitive Determination of Copper in Aviation Fuels" (PB 111888, 50¢) discusses a method of quantitive determination of ionic copper in aviation fuels in concentrations as low as 1 ppm. of copper.

• "Research on Boron Polymers" (PB 111892, $2.25) covers an exploratory study of boron compounds and polymers aimed at finding thermally stable and oil- and fuel-resistant plastics and elastomers. The project included synthesis of quadricovalent chelate and quasi-chelate boronic acids and borates.

• "Research on the Preparation and Properties of High-Temperature-Resistant Copolymers" (PB 111765) investigates the reaction between *p*-dichorobenzene and alkali metals in the presence of various unsaturated compounds, e. g., vinyl acetate, ethylene, isobutylene, methyl acrylate, acrylonitrile, 1-3 butadiene.

hi-lites on hi-fax* and other Hercules plastics.

Our Hi-fax plant is underway! Construction has begun in Parlin, New Jersey on the new plant which will produce Hi-fax, a versatile new ethylene polymer made by the Hercules process.

facts about hi-fax

Hi-fax is the name of a new ethylene polymer to be made by the Hercules process. Hi-fax provides a completely new plastic with an unusual combination of properties unmatched by any material previously available.

Hi-fax is truly heat resistant! Can be immersed in boiling water without distortion. Insoluble in water or organic solvents below 100°C.

Hi-fax is rigid and strong! Hi-fax has four to five times the rigidity of regular polyethylene. It has double the strength.

Hi-fax has exceptional low temperature toughness! Retains its impact strength at extremely low temperatures.

Hi-fax has superior resistance to chemicals, solvents and greases! The fluid permeability of Hi-fax is only ⅛ that of conventional polyethylene.

Hi-fax is richly colorful with an attractive lustrous finish!

Hi-fax is easy to fabricate! Can be molded by compression, extrusion and injection techniques and machined by conventional methods.

If you make or design toys, housewares, industrial moldings, sheet and film, pipe, bottles, or electrical insulation, Hi-fax offers a better plastic for the specific requirements you must meet. That's why we consider Hi-fax the plastic of tomorrow for tomorrow's superior products.

*Hercules trademark

HI-LITE ON hercocel®

In design, production, and sales, versatile Hercocel continues its job of keeping new products on the move. Long-wearing and durable, economical and easy-to-mold, Hercocel—Hercules® cellulose acetate—is the perfect plastic for many products. The Dormeyer "Edge-Well" Sharpener, for example, is molded with Hercocel and is guaranteed by the manufacturer for one year against defects in material or workmanship. The Hercocel housing for the "Edge-Well" is molded by Plastic Precision Parts Co., 2535 West Madison St., Chicago, Ill. It is a product of the Dormeyer Corporation, Kingsbury and Huron Sts., Chicago 10, Ill.

Cellulose Products Dept.

HERCULES POWDER COMPANY
INCORPORATED

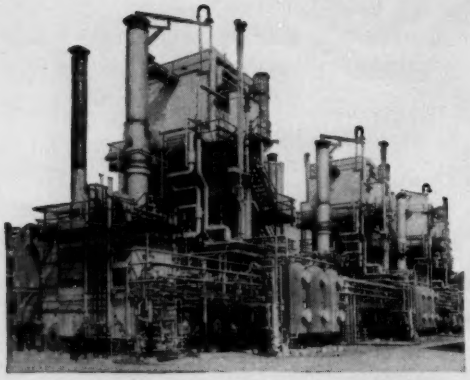
992 Market Street, Wilmington 99, Del.

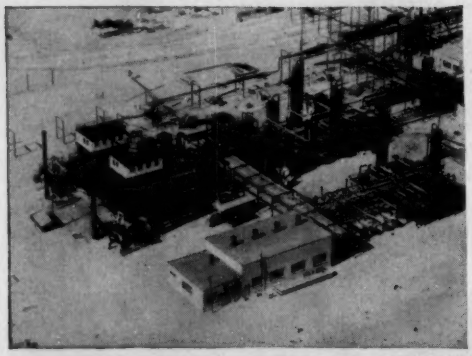
CP56-2

HYDROGEN

...how much do you need?

Girdler offers you complete engineering-construction service for BIG-CAPACITY *plants*





When you plan facilities for "tonnage hydrogen" for treatment of refinery feed stocks and hydrocarbon products, it will pay you to take advantage of Girdler experience.

Big plant experience: Girdler has designed and constructed large plants for petroleum products and chemicals. Two hydrogen plants have been built each of which can produce gas at the rate of seventy million cubic feet per day. More than 45 Girdler hydrogen plants are giving outstanding performance in the United States and Canada.

Girdler manufactures all of the catalysts used in Girdler hydrogen plants. These catalysts permit high production rates.

Call or write for complete information

The GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
LOUISVILLE 1, KENTUCKY
GAS PROCESSES DIVISION • DISTRICT OFFICES: New York, San Francisco

Technology

Newsletter

CHEMICAL WEEK
June 16, 1956

Giulio Natta—in New York City last week en route to the Gordon Conferences in New Hampshire (*see also pp. 64, 79*)—stopped off at the Chemists' Club to "meet the press" and clear up some of the mysteries surrounding his work on polyolefins. With Piero Giustiniani, managing director of the Montecatini group (who will also participate in the Gordon Conferences), he made these points:

• **On licensing arrangements.** Montecatini has exclusive rights to Natta's work at the Milan Institute. So far, it has not licensed anyone. But Giustiniani made it clear that negotiations with companies in this country are under way and should be completed shortly.

• **On relationship of Natta's work to that of Germany's Karl Ziegler.** Whether or not Natta's catalyst is a "Ziegler catalyst" depends entirely on how you define a Ziegler catalyst. Like Ziegler, Natta uses heterogeneous catalysts of metal alkyls and metal halides. Presumably, however, the actual compounds Natta is employing as catalysts differ from those used by Ziegler.

It seems quite apparent that Ziegler has agreed—tacitly at least—to confine his interests to ethylene polymerizations, while Natta concentrates on polymerizing olefins of three carbon atoms and more. It's interesting, in this context, that Ziegler's Belgium patent (538,782) covering polypropylene is assigned to Montecatini.

• **On the process.** Natta is keeping details of the process secret. He does say that the olefin (e.g., propylene) takes part in a direct reaction to form the desired "isotactic" or "syndotactic" polymer in good yields. The tedious extractions described in some of the earlier work are not necessary. Also, he said the process could be carried out with or without solvents. He refused to identify any of the catalysts he used, but implied that several were found to be suitable. The physical characteristics of the catalyst, he emphasized, are a more important consideration than the chemical composition.

• **On the purity of the starting material.** The process does not require a pure starting material as do polyethylene processes.

• **On the scope of his work.** He has worked with compounds of as many as 10 carbon atoms. Most talked about: propylene, butylene, styrene.

• **On commercial prospects.** The "several tons a day" plant that Montecatini hopes to have in operation next January will concentrate on polypropylene, initially. Most promising outlets for the product in the immediate future are molded articles and films. The firm expects commercialization of polypropylene fiber to take a little longer.

• **On drawbacks of the products.** Polypropylene produced by Natta's work is subject to oxidation—but Natta says it can be easily stabilized. Dyeing of the fibers is a problem, but Giustiniani believes it is not by any means insurmountable. He points out that all the problems concerning the dyeing of acrylics and even polyesters are not solved. (Item: piece of experimental polypropylene yarn being shown by the pair was pale blue in color.)

• **On possibility of reciprocal licensing arrangements.** Said Giustiniani: "I do not like to exchange processes. I would rather buy one from someone, and then sell him ours."

He did admit, though, that he is interested in looking at hydrogen peroxide processes. Montecatini now makes peroxide by the electrochemical route. And Giustiniani is favorably impressed by costs via chemical processes employed recently by U.S. firms. But he added that although chemical processes seemed very economical for large installations, he wasn't at all sure of how they would look on a smaller scale.

In any case, in view of Montecatini's expressed interest in hydrogen peroxide, it is not at all unlikely that he could find a "community of interests" with a company like Du Pont, which has a going chemical process for hydrogen peroxide and an obvious interest in Natta's work.

• **On definition of isotactic and syndotactic.** When asked the difference, Natta was sitting at a table flanked (right) by Brooklyn Poly's Herman Mark and (left) Giustiniani. Standing, and grabbing Mark's left hand in his right and Giustiniani's right hand in his left, Natta said: "This is an isotactic polymer." Then, turning his back to the audience (while the other two remained in position), he again took their hands (his left in Mark's left, etc.) and said: "This is a syndotactic polymer."

•

The Atomic Energy Commission will help the Yankee Atomic Electric Co. develop and operate a large-scale nuclear power plant at Rowe, Mass.—according to a contract just signed. The plant will cost approximately $34.5 million to build, have a minimum capacity of 134,000 kw. Yankee Atomic Electric is owned by public utilities representing all six New England states. Westinghouse is the design and development agent for the project; Stone and Webster will do the building.

•

The Atomic Energy Commission is also seeking proposals from prospective participants in a gas-cooled power-reactor experiment planned for the National Reactor Testing Station in Idaho. The experiment will cost about $4 million over a period of years, is aimed at getting engineering data and experience that can be used to build small military and civilian package power reactors.

•

Krebiozen, the highly controversial compound that was supposed to be a cancer "cure," has undergone a secret chemical analysis at the Clark Microanalytical Laboratory (Urbana, Ill.). Finding: "Krebiozen could be a mixture of organics having few terminal methyl groups. The end of the chain could be carboxyl, hydroxyl or aldehyde groups. From the absorption bands, it is possible that there are other species of carbonyl groups present, in addition to those associated with the free acid groups."

TRIMETHYLOLPROPANE

another new aldol product from Celanese

1 **In continuous large volume . . .**
2 **With exceptionally high purity . . .**
3 **At a new low cost . . .**

For all producers of polyurethanes and alkyd resins, Celanese expanded production of trimethylolpropane—in the right volume, quality, and at a new low price—is important news.

No longer will it be necessary to pass up the processing and product improvements this polyol can contribute. Now manufacturers can take full advantage of the better adhesion, color, color retention, and hardness it provides in alkyd-based baking enamels . . . the greater mixing ease it offers in compounding polyesters and pre-polymers with diisocyanates.

The way is also clear now for the commercial development of other indicated uses for trimethylolpropane—in the production of synthetic drying oils, plasticizers, surface active agents, polyesters. For working samples and prices write to Celanese Corporation of America, Chemical Division, Dept. 552-F, 180 Madison Ave., N. Y. 16.

CELANESE® TRIMETHYLOLPROPANE

Specifications

Hydroxyl value, % by wt., min.	37.5
Water content, % by wt., max.	0.05
Color (10% soln.), APHA, max.	5
Phthalic color, Gardner, max.	1
Acidity, as formic, % by wt., max.	0.002

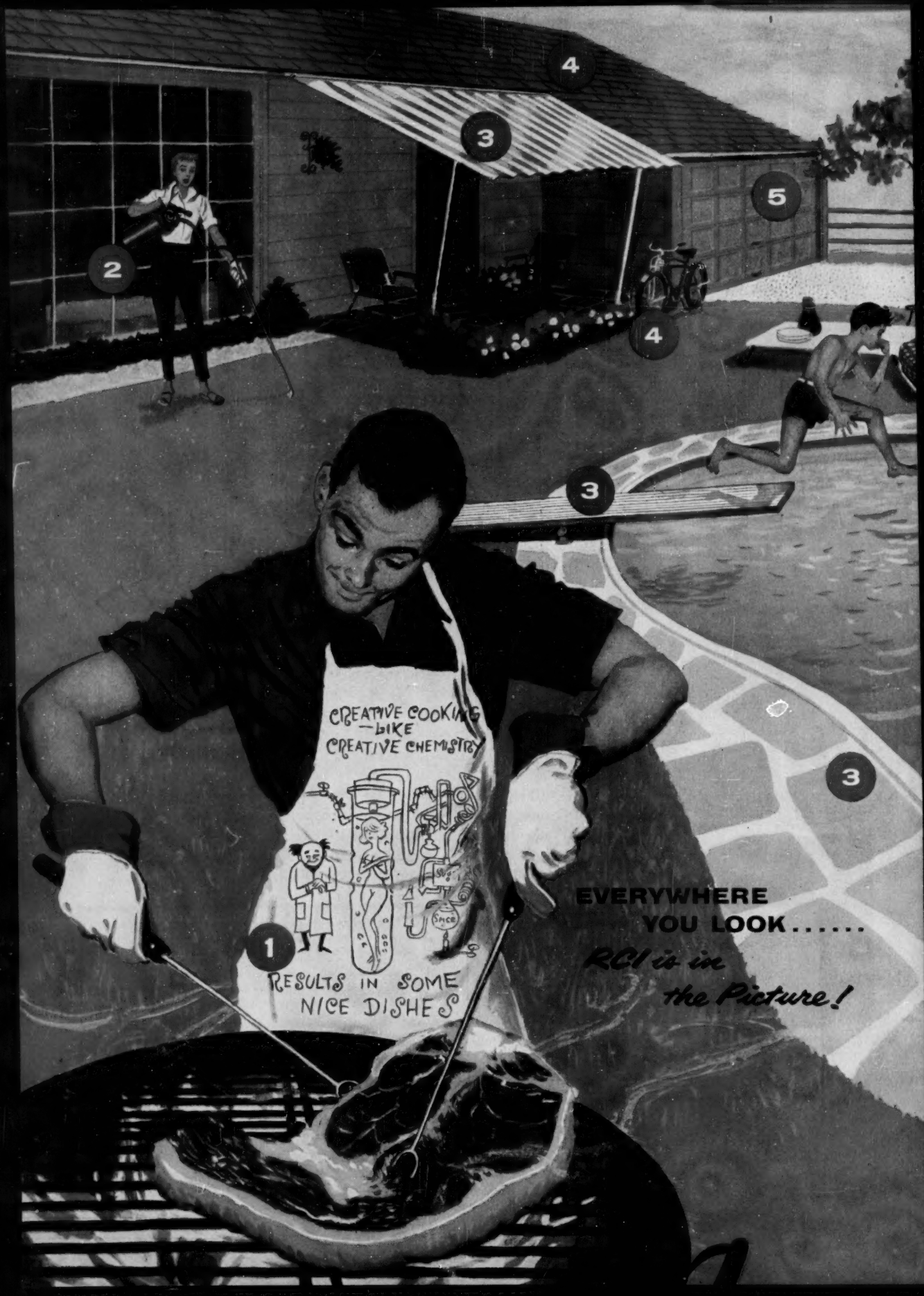
Q. Why can Celanese produce trimethylolpropane at a price well below that of comparable purity grades?

A. Through the production efficiencies and economies of expanded aldol capacity . . . special Celanese-developed processes . . . and a basic position in aldehydes.

Trimethylopropane is the second in a new series of aldol developments and will be followed by several others—new polyols, glycols and aldehydes. Celanese* 3-Methoxy Butanol, first in the series, is already being produced in large quantities.

Celanese* CHEMICALS

*Reg. U. S. Pat. Off.


CREATIVE COOKING
—LIKE
CREATIVE CHEMISTRY
RESULTS IN SOME
NICE DISHES
EVERYWHERE
YOU LOOK.....
RCI is in
the Picture!

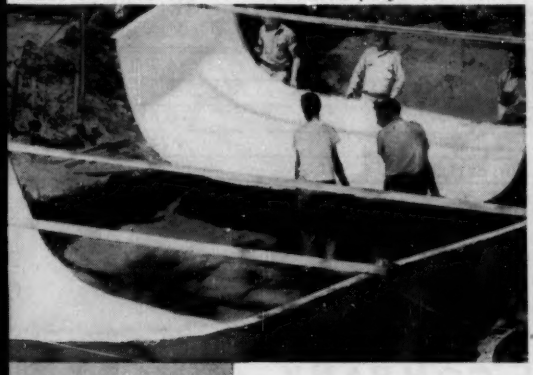
EVEN THE APRON TIES IN WITH RCI

1. **RCI phthalic anhydride** – The "Creative Cooking" apron shown at left and below is made of tough vinyl film. RCI is a dependable source for phthalic anhydride which is the base for so many vinyl plasticizers.
2. **RCI phenol** – whether you make weed killers or use phenol in manufacturing synthetic resins, Reichhold can make fast delivery via drum or tank car wherever your plant is located.
3. **RCI polyester resins** – reinforced with fibrous glass have ideal properties for architectural panels like the patio roof shown here . . . also for economical plastic swimming pools and safe, waterproof diving board surfaces.
4. **RCI chemical colors** – lend brightness to asphalt shingles (via granule coating) . . . help give lasting beauty to paints for bicycles and metal toys.
5. **RCI phenol-formaldehyde resins** – find a major use as strong, water-resistant adhesives for exterior fir plywood.
6. **RCI surface coating resins** – The exceptionally complete RCI line includes high quality alkyds (based on RCI glycerine, phthalic anhydride and pentaerythritol) for manufacturing a great many special finishes . . . such as enamels for outdoor furniture.
7. **RCI pentachlorophenol** – in preservative solutions helps make wood exposed to weather last up to 4 times as long as untreated wood.

Which one of these materials do you need?

The next time you have a supply problem (or a technical problem) take a look at RCI. See where fast delivery of these quality-controlled RCI materials (and the additional ones listed with our signature) can help *you*.

Piecing a pool together—It takes no time to assemble the light weight, durable sections of this plastic pool. Low-cost and easy-to-maintain, the pool is made of reinforced RCI POLYLITE polyester resin.



FREE – no strings (almost) THIS **"CHEMIST'S COOK-OUT APRON"** with "Chemical Peddler" cartoon. All you do is return this coupon with one interesting additional application of an RCI product like those shown in our picture. (That's just to make you work a little since our apron supply is *not* unlimited!)

Name_____

Title_____

Company_____

Street_____

City_____ Zone____ State_____

CW

Mail coupon to Reichhold Chemicals, Inc.
RCI Building, White Plains, N. Y.

Creative Chemistry . . .
Your Partner
in Progress

RCI

REICHHOLD

Synthetic Resins • Chemical Colors • Industrial Adhesives • Plasticizers
Phenol • Formaldehyde • Glycerine • Phthalic Anhydride • Maleic Anhydride
Sodium Sulfite • Pentaerythritol • Pentachlorophenol • Sulfuric Acid

REICHHOLD CHEMICALS, INC., RCI BUILDING, WHITE PLAINS, N. Y.

For the 1st time! META-XYLENE in commercial production

Have you considered the opportunities xylene isomer intermediates offer you for new or improved products? Or, perhaps a xylene isomer will provide you a better, more economical raw material as an alternative route in your present production.

Oronite was the pioneer and is today the leading producer of xylene isomers—the only source offering all three xylene isomers (meta, para, ortho) in commercial quantities. Inquiries are invited; trial quantities available. Contact the Oronite office nearest you for further information.

and

Oronite is your only commercial source for all 3 xylene isomers!

Typical tests of current production		TYPICAL TESTS
META-XYLENE	Meta-Xylene, % (wt.)	95.1
	Boiling Range, °C (start to dry)	1.0
	Specific Gravity, 60°/60°F	0.869
	Color, Saybolt	+30
	Sulfur Compounds, as H_2S or SO_2	None
	Paraffins, %	0
PARA-XYLENE	Para-Xylene, % (wt.)	95.4
	Boiling Range, °C (start to dry)	1.0
	Specific Gravity, 60°/60°F	0.865
	Color, Saybolt	+30
	Sulfur Compounds, as H_2S or SO_2	None
	Paraffins, %	0.20
ORTHO-XYLENE	Ortho-Xylene, % (wt.)	86.3
	Boiling Range, °C (start to dry)	1.2
	Specific Gravity, 60°/60°F	0.875
	Color, Saybolt	+21
	Sulfur Compounds, as H_2S or SO_2	None
	Paraffins, %	8.0

ORONITE CHEMICAL COMPANY

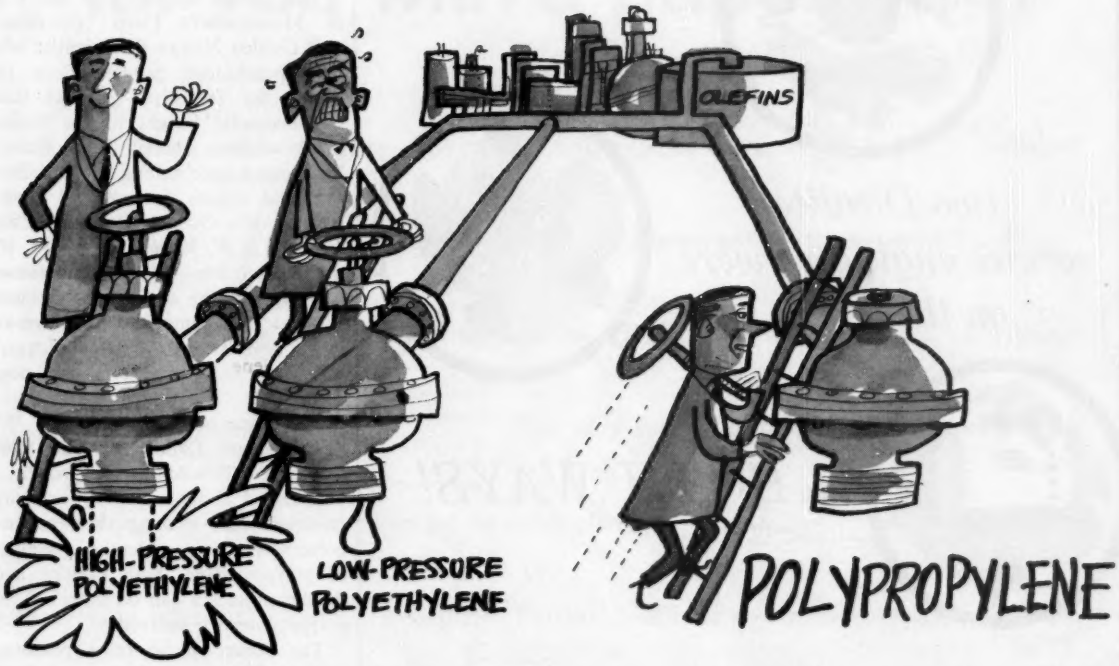
ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES: 200 Bush Street, San Francisco 20, California

SALES OFFICES

30 Rockefeller Plaza, New York 20, N. Y. — 20 North Wacker Drive, Chicago 6, Illinois
450 Mission Street, San Francisco 5, Calif. — Mercantile Securities Bldg., Dallas 1, Texas
Carew Tower, Cincinnati 2, Ohio — 714 W. Olympic Blvd., Los Angeles 15, Calif.
36 Avenue William-Favre, Geneva, Switzerland

3901



Polyolefins: Will Three Be a Crowd?

Today the silence is conspicuous; but before long there should be plenty of shouting about polypropylene, top candidate for the next plastics boom. Reason: scores of firms are applying for manufacturing licenses. And there's a hot race on between European and American processes.

At the moment, Montecatini appears to be running well out front, and expects to complete negotiations with its first U.S. licensees "within a few weeks."

Signing of license contracts by even a couple of firms could well signal the beginning of a big rush to climb aboard the bandwagon—much the same as happened with polyethylene, first cousin of polypropylene.

It's not surprising, then, that industry spokesmen are reticent to discuss the new polyolefin in anything but general terms, aver that "it's still premature to talk about polypropylene." Potential competition is awesome, and many technical problems must be solved before the new material's impact on the plastics market can be forecast with reasonable certainty.

However, on the basis of such facts as can be learned from industry experts, here's how the polypropylene picture looks now:

How Soon? U.S. polypropylene won't hit markets soon. At least two years will be needed to eliminate remaining technical hitches and get production under way.

This doesn't imply that polypropylene is still just paper chemistry. Montecatini in Italy has operated a pilot plant for four or five months, and is building a commercial-scale plant of "several tons/day capacity" at Ferrara that will be ready early in '57.

It would be pessimistic to think that development in the U.S. will take much longer than a couple of years, though. The fantastic speed with which polyethylene production and markets were developed, for example, is clear indication of what the plastics industry is geared to do with a new material.

In fact, the phenomenal success of polyethylene should do much to spur speedy promotion of polypropylene if only because the precedent puts plastics makers in a good position to judge market reactions to polypropylene.

Those who may have hesitated—and missed the boat with polyethylene—can now find in polyethylene's production figures the assurance they need to take a belated plunge into the polyolefin business.

This, in fact, may help explain why so many firms have already indicated considerable interest in polypropylene. Spokesmen for Montecatini (the firm promoting the European process in most foreign countries) say that at least 35 license applications have been received; not all these applicants are in this country, but there's reason to believe that well over half are U.S. manufacturers.

Montecatini's applicants by no means comprise the total count. Others are independently pushing work on polypropylene; Phillips is one, Standard of Indiana is another.

To what stage these U.S. firms have developed their processes is a matter of conjecture. Some observers believe that the American firms are far ahead in polypropylene technology. Montecatini spokesmen disagree, advance the argument that imminent signing of contracts with licensees in this country

for the European process is tacit proof of leadership.

The arrival last week in the U.S. of Montecatini's Piero Giustiniani, and Guideo Natta—the scientist who has spearheaded polypropylene research for the firm—gave at least circumstantial weight to the Italian firm's claims. Though both visitors have come here ostensibly to deliver technical papers on polymer chemistry at the Gordon Research Conferences (*CW, March 24, p. 91*), it's not improbable that their presence will expedite the signing of contracts.

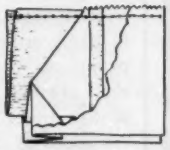
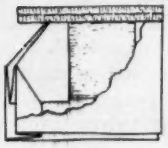
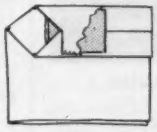
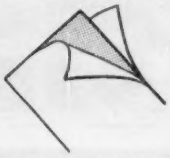
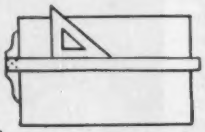
What U.S. companies are involved in the negotiations? Montecatini won't say, and U.S. producers are noncommittal. However, the answer should come soon.

Convenient Capacity: Aside from those who will build new polypropylene plants, just about any producer with facilities for making low-pressure polyethylene is a potential producer of polypropylene; both Phillips and Ziegler processes can be modified for polypropylene manufacture.

The dozen or so firms planning units for the manufacture of low-pressure polyethylene include: Celanese, Dow, Du Pont, Grace, Hercules, M. W. Kellogg, Koppers, Koppers-

MONTECATINI'S Natta: Polypropylene emissary.

LOOK what Fulton can do for you with a paper bag!

Fulton's sewn multiwall bags can be ordered with regular valve,  a creped tuck-in sleeve  or a variety of inner sleeves such as the superior Ful-Flex®.  In pasted multiwall bags you get a choice of valves with or without inserts and extensions.  You may specify printing on any paper bag in non-skid, non-rub Ful-Grip Ink (at no extra charge)  permitting higher stacking without slipping. Ful-Flex® Elastic Multiwalls—low-cost replacements for rigid containers—  have three to five plies of tough crinkled paper . . . can be moisture-proofed  with a special barrier ply . . . are strong, easy to handle, convenient to store. WPPL (Water Proof Paper Lined) textile bags with paper or polyethylene  laminations keep out dampness, retain proper moisture inside. Or if you have other difficult packaging problems,  Fulton's Special Services Division will assist  in developing a package that suits you perfectly. Just call  or write  your nearest Fulton branch today.

Fulton
BAG & COTTON MILLS

ATLANTA • CHICAGO • DALLAS • DENVER • KANSAS CITY
LOS ANGELES • MINNEAPOLIS • NEW ORLEANS • NEW YORK • OKLAHOMA CITY
PHOENIX • ST. LOUIS • SAN FRANCISCO • SAVANNAH • WINTER HAVEN

Brea, Monsanto, Phillips, Union Carbide.

Planned plant capacities reportedly range from 30 to 60 million lbs./year; the Phillips plant is an exception, will be able to make 110-120 million lbs./year. Combined capacity of these producers is an estimated 420 million lbs./year.

How much, if any, of this capacity is likely to be converted into polypropylene production? It's doubtful that anyone would hazard a guess at this time. Too much depends on the speed of polypropylene's commercial development, and on the ultimate competitive advantages (or disadvantages) of polypropylene over polyethylene.

Whose Market? The competitive relationship between polyethylene and polypropylene is complex; there's still little agreement on how much the uses of low- and high-pressure polyethylene overlap; and, obviously, there is even less basis on which to evaluate polypropylene's share of the coming polyolefin plastics market.

For example, low-pressure polyethylene has greater heat resistance than the high-pressure material, will be preferred for items such as sterilizable bottles; if flexibility rather than heat resistance is of prime importance—as in garden hoses—high-pressure polyethylene will probably be favored.

Many applications between such extremes could be satisfied by either product, will provoke keen competition between the two types of polyethylene.

How does polypropylene fit into the picture? Generally speaking, polypropylene holds the same relationship to low-pressure polyethylene as the latter holds to high-pressure polyethylene, i.e., higher molecular weights, higher melting points, greater heat resistance.

It can be molded into rigid and semirigid objects, extruded as film, and made into fibers having approximately the same tensile strength as nylon. In Italy, where the first commercial polypropylene will be hitting the market in '57, the plastic will start selling for about the same price as polyethylene (now 44¢/lb.), but will probably drop in price with expanding production. It will first be used for molding and films, and then, when technical problems have been

CERIUM OXIDE

—a rare earth that sparked a revolution in a long established art in the glass industry

a report by LINDSAY

Some twenty years ago in Switzerland, two technicians discovered the amazing glass polishing properties of Cerium Oxide. Soon it was being used extensively for polishing of precision lenses in Europe.

Then came World War II. Scientists in the optical industries in this country heard about Cerium Oxide . . . how it could polish faster and cleaner than any other known material. They thought that maybe this was the answer to the problem of accelerated production of precision optical pieces for our war machine. In a cloak and dagger operation, samples of Cerium Oxide were smuggled out of Switzerland. Tests confirmed the rumors . . . Cerium Oxide was IT!

This was early in the 40's when Hitler held most of Europe and the Japanese were driving toward Australia. The urgency of our growing war effort was putting fantastic demands on the optical industry. Lenses for bombsights, range finders, periscopes and other military instruments were needed desperately. Production had to be increased manyfold with no sacrifice of split-hair accuracy.

Lindsay, the nation's largest processor of monazite (the chief source of rare earths), undertook in 1942 the challenging task of producing Cerium Oxide. Day after day, Lindsay technicians worked with patience and speed to solve the inevitable production problems and in a remarkably short time, Cerium Oxide was being refined with the properties that met the demanding standards of the optical and glass industries. At about the same time, Barnesite, a rare earth oxide for ultra-high precision work, was developed and a few years later Lindsay took over exclusive production.

By war's end, Cerium Oxide had virtually revolutionized glass polishing practices in this country. Today, it is widely used in the production of distortion-free TV tubes, fine quality mirrors and precision optical lenses.

Opticians like Lindsay's Cerium Oxide (sold under the trade name CEROX) because it enables them to polish lenses to prescription specifications faster and to give you glasses exactly as the doctor ordered.

Leading automobile manufacturers use Lindsay's Cerium Oxide to polish out windshield scratches just before shipment. One of the largest producers furnishes its dealers with kits containing Cerium Oxide to remove nicks and scratches picked up in transit.

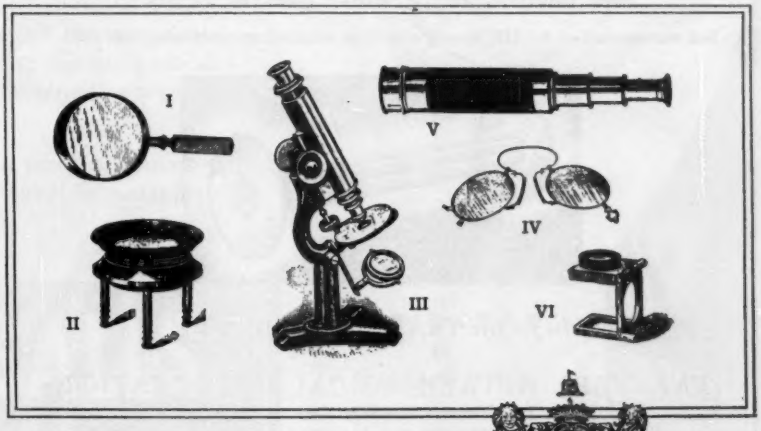
Why is Cerium Oxide such wonderful stuff when it comes to polishing? Frankly, nobody knows. Lindsay's technical people have tested and retested it, put it through countless laboratory analyses and peered at it for hours through high-powered microscopes. Just as scientists know how to *use* electricity, but don't know what it *is*, so too, they know that Cerium Oxide is a remarkably efficient polishing agent but *why* is still a mystery.

Like all the other rare earths, Cerium Oxide is a versatile material. Research disclosed its unique potentials (along with didymium, neodymium, and other rare earths) for use in coloring and decolorizing glass and it is extensively used for that purpose. Another interesting use is as a catalyst with some chemical materials.

Twenty-five years ago, most chemists had little knowledge or curiosity about the rare earths. Then the dramatic emergence of Cerium Oxide as an important factor in the optical industry excited interest in the full range of the 15 rare earth elements—atomic numbers 57 through 71.

There are technical people who think that some of the rare earths have greater possibilities of revolutionizing processes in their industries than Cerium Oxide has had for polishing practices. We are encouraged to think so, too. We are shipping rare earths regularly for use in the production of such diverse materials as steel, aluminum, glass, ceramics, textiles, ammunition and for a variety of applications in the electronic and atomic industries.

We can give you comprehensive data about the many rare earth and thorium salts available. Your technical staff may find it rewarding and profitable to take a long, thoughtful look at these unique materials, to examine their characteristics and, particularly, their potential applications to your own processes.



PLEASE ADDRESS INQUIRIES TO: LINDSAY CHEMICAL COMPANY
270 ANN STREET, WEST CHICAGO, ILLINOIS

solved, will be used in making fibers.

Strongest competition, therefore, can be expected between polypropylene and low-pressure polyethylene. But should the newer material have a decided market advantage over low-pressure polyethylene—as many predict—it won't spell insurmountable trouble for makers of low-pressure polyethylene whose plants could be converted to making the newer plastic.

Producers of high-pressure polyethylene are in a different boat since switchover to the manufacture of polypropylene would not be feasible; these producers will face competition from both low-pressure polyethylene and from polypropylene.

Too, there's the probable impact of polypropylene on polystyrene, which is bracing for stiff competition from low-pressure polyethylene.

Cost Angle: Polypropylene seems to have an economic advantage over low-pressure polyethylene; propylene—the raw material used to make the polymer—is readily available and inexpensive.

However, some marketers foresee a possible shortage of propylene if the new plastic grows into a truly large-volume item. Yet there may be a way out, strangely enough, through development in a totally unrelated industry—the manufacture of tetraethyl lead antiknock additives.

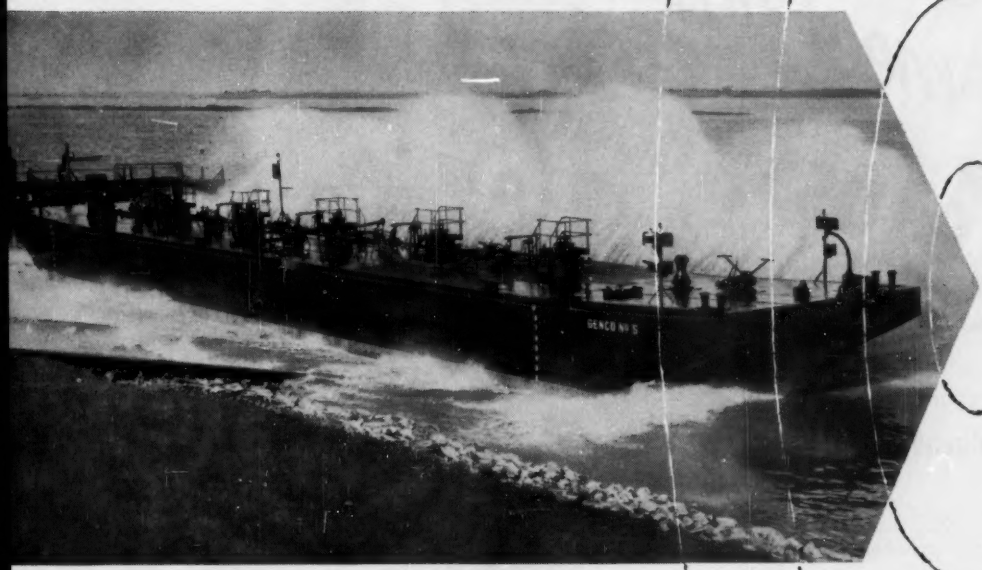
The solvent for tetraethyl lead used in auto gasoline consists of 50% ethylene dichloride and 50% ethylene dibromide. Aviation gasoline, on the other hand, has long been made with TEL dissolved in ethylene dibromide alone; this may also become true of future high-octane auto gasolines.

If desired octane ratings of auto gasoline can be obtained by modifying the TEL solvent, producers of propylene may be quite willing to divert larger amounts of propylene to plastics, send less to polymerization units for the manufacture of high-octane gasoline.

Before these production problems come to the fore, however, other obstacles must be overcome—in particular, improvement of the plastic to make it useful as a fiber (*see p. 64*) as well as a molding material. But polypropylene proponents are confident that these technical problems will be licked, predict a bright future for this third member of the fast-growing polyolefin plastics family.

PERFECTLY AIMED AT A

Technical Target



An ever-growing number of Ingalls-built barges are designed to exacting specifications that meet and fully solve special problems of chemical transport.

A case in point is this sulphuric acid barge for the General Chemical Division of the Allied Chemical and Dye Corporation, New York. Equipped with 3 hydraulic-driven pumps for unloading, it was designed to perform a specific transportation task and built to the classification requirements of the American Bureau of Shipping.

A logical first step to a skilled and practical solution of your waterways-transport problem can be that of discussing it with Ingalls today.

INGALLS
WORKBOATS

DESIGNERS & BUILDERS
of Offshore Service Vessels
Drilling and Commercial Barges,
Tankers, Naval and Merchant Vessels.

THE INGALLS SHIPBUILDING CORPORATION

EXECUTIVE OFFICES: Birmingham, Alabama, U. S. A. *SHIPYARDS: Pascagoula, Mississippi; Decatur, Alabama*
OFFICES: New York, Washington, Chicago, Houston, New Orleans, Philadelphia, Atlanta

Market
Newsletter

CHEMICAL WEEK
June 16, 1956

The 2-month-old price-cutting war on phosphoric acid finally appears to be ending. Victor Chemical, pinched by recent increases in labor rates, raw materials and freight charges (as are most phosphoric producers), late last week moved to post a 25¢/cwt. hike on its 75% and 80% acid.

The advances aren't industry-wide yet, but Victor's action is being described, even by competitors, as "getting back to a sensible business basis"—an indication that other makers will be happy to follow suit.

The new prices, which become effective immediately on "open accounts" and on July 1 to contract customers, restore pre-April levels. Tank-car and tank-truck tags: for 75% material, $5.35/cwt.; 80%, $5.75/cwt.

Effective the first of next month, prices on several chlorinated solvents will also go up—and for the now-familiar "higher manufacturing and freight costs" reason. At least one major seller will alter schedules, by about ½¢/lb. on t.c. and t.t. orders, on carbon tetrachloride, 1,1,1-trichlorethane, trichlorethylene, perchlorethylene, methyl chloride, and methylene chloride.

C.l. and l.c.l. tags on some (e.g., carbon tet, methylene chloride) will be boosted by ¾¢/lb., and, says that producer, Zone 2 pricing on carbon tet and perchlorethylene will be eliminated to establish a single across-the-country price on each.

•

Just about all bulk quantity rubber-grade styrene users are now, or will soon be, paying less for their purchases. Shell Chemical started the ball rolling last week with a ½¢/lb. cut in tank-car deliveries, announced a new 16¢ price. C.l. and l.c.l. quotes, however, remain unchanged at 18½¢ and 19½¢, respectively.

Dow Chemical followed quickly with similar reductions, and, in addition to a ½¢ cut on styrene, reduced its vinyltoluene prices by ½¢/lb., also on tank-car and tank-truck quantities only.

Business in the rubber-grade styrene monomer has been falling off lately, and though producers don't really expect the lower prices will contribute much to a sales spurt, they are hoping the cuts will broaden interest among consumers who haven't been accustomed to buying in bulk quantities.

On the heels of other price cuts, the tab on 98% isonicotinic acid has been dropped by Reilly Tar & Chemical. The new price, f.o.b. Indianapolis, is down 75¢/lb. to $4.25.

Explained as a "current price reduction policy based on improved production facilities," the slash follows a recent 65¢/lb. paring of 98% 4-picoline (gamma picoline) prices to $2/lb., f.o.b. same source.

Phenolic molding compounds are the latest items to echo the recent price hike on phenol (*CW Market Newsletter, June 9*).

New prices posted by General Electric range from 1½¢/lb. on volume purchases of standard, general-purpose molding compounds to 3¢/lb. on certain specialty molding compounds. Included is a 2¢/lb. rise in the cost of shell molding resins.

Ethyl alcohol prices are going up, too—and the increases are greater than most trade observers had expected (*CW Market Newsletter, April 28*). Although the competition may not know it yet, Publicker is notifying its customers that alcohol will be upped 5¢/gal. across the board (in contrast with 3¢/gal. predicted earlier), with variations in schedules of some higher SDA formulas.

Before the end of the week, though, you can bet that just about all alcohol sellers will be quoting Publicker's new 47¢/gal. tank-car tag on the 190-proof, tax-free material, as well as higher drum-lot prices.

•

Predictions of an ammonia glut become increasingly meaningful as producers line up for a general price cut. Last week, it was Allied's Nitrogen Division (*CW Market Newsletter, June 9*); this week, it's Spencer Chemical.

Effective July 1, Spencer's fertilizer-grade ammonia will drop $5/ton—to $80 c.l., f.o.b. production points. Refrigeration-grade tabs will show a like decline, from $87.50/ton to $82.50, same basis.

The slump in farm chemicals consumption—in part responsible for the ammonia industry's difficulties—is also having a pronounced effect on the phosphate market.

Last week, International Minerals and Chemical closed one of its three phosphate rock mines in Florida because of "a greater than seasonal slump in sales of fertilizer."

Meanwhile, American Cyanamid has shortened the work week at its phosphate mining operations, from 42 to 40 hours; and Davison Chemical—though not yet reducing operations—finds this a convenient time to build up inventories for fall sales.

•

TEL will take to water for the first time when, in early '57, Du Pont starts shipping the antiknock agent by tanker from the firm's New Jersey plant to expanded storage facilities at Beaumont, Tex.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending June 11, 1956

	Change	New Price
UP		
Bisphenol-A, c.l., t.l., frt. alld.	$0.005	$0.2975
Bromine, purif., cs., c.l., t.l., dlvd. E. of Rockies	0.01	0.32
DOWN		
Cyclohexanone, tech., dms., c.l., works	$0.01	$0.335
Isonicotinic acid, 100 lb. fib. dm., works	0.75	4.25
Styrene SRG, 99% dms., c.l., frt. alld.	0.005	0.18
Toluol, coal tar, tanks, works, Bethlehem, gal.	0.02	0.32
Vinyltoluene, dms. c.l. frt. alld.	0.005	0.185

All prices per pound unless quantity is stated.

Chemical inertness of polyethylene

Safeguards purity of contents

Polyethylene bags for Oppenheimer casings are made by **Tee Pak, Inc.**, Plastic Film Division, Chicago, Ill.

Using film made of BAKELITE Brand Polyethylene, Oppenheimer Casing Co., Chicago, Ill., met two prime requisites in packaging their natural casings for sausages and frankfurters.

According to Edward H. Oppenheimer, president, "Protection of product comes first. Since polyethylene is so chemically inert, there is no danger of product contamination. And, as we wet-pack casings in a special liquid preservative, the moisture impermeability, proper gas transmission, and tight heat-seal of the film makes it the most practical."

These same qualities are equally advantageous for packaging chemicals—liquids and powders—of a wide variety. And the low cost of polyethylene is a pleasing extra benefit. Ask your packaging supplier. Or write to Dept. PD-34.

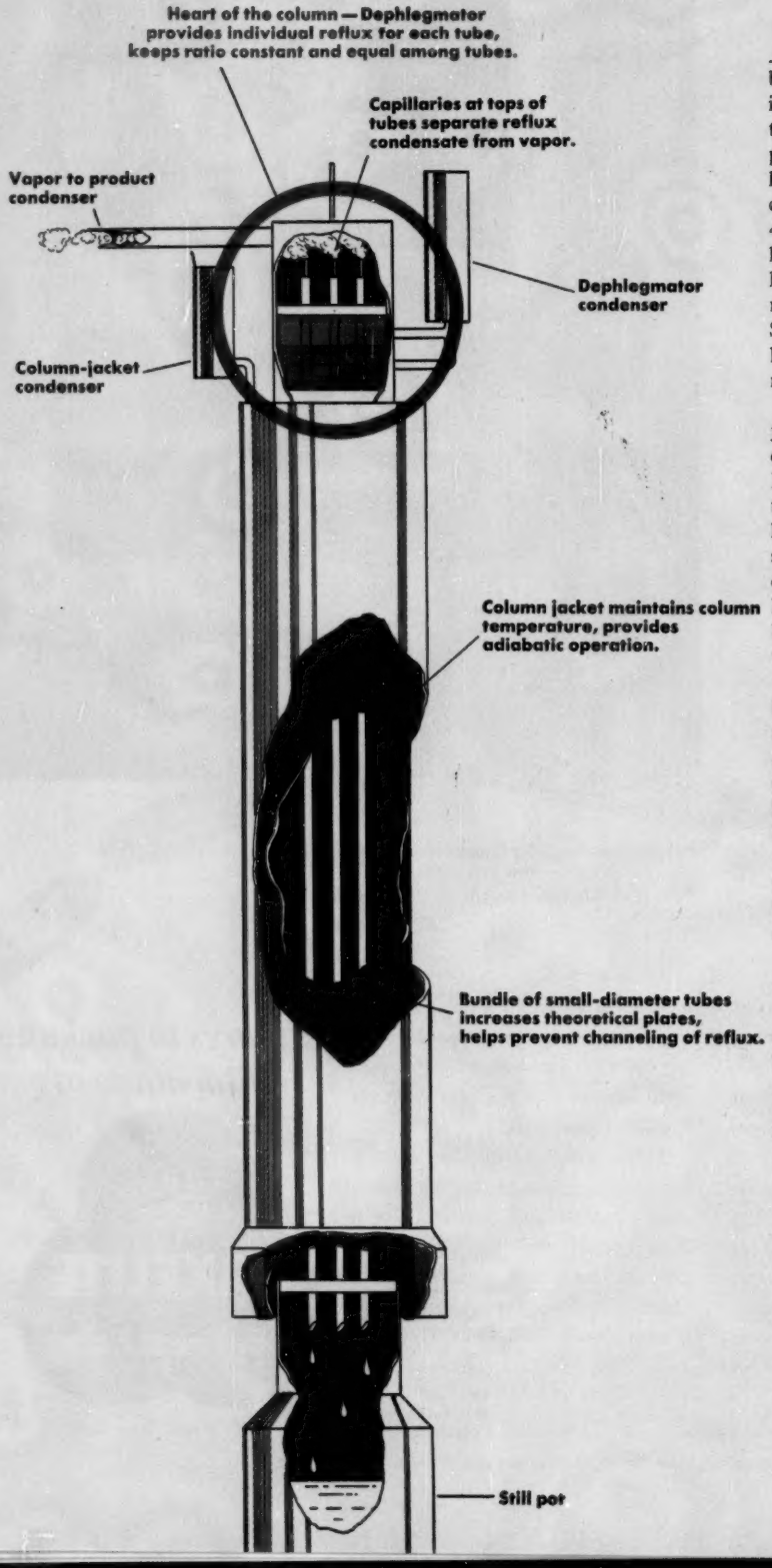
It pays to package in film made of

BAKELITE
BRAND
Polyethylene Plastic

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

Control Moves Up to Top Spot



AS ANY distillation engineer will testify, separating liquids that boil at almost identical temperatures is about as tough as trying to remove the holes from Swiss cheese. But it's probably no coincidence that the Swiss have come up with a new rectifying column that's said to provide up to 400 theoretical plates for separating liquids that differ in boiling point by less than one degree. It's the Kuhn rectifying column that the firm of Sulzer Bros. Ltd. (Winterthur, Switzerland, and New York) is currently readying for commercial application.

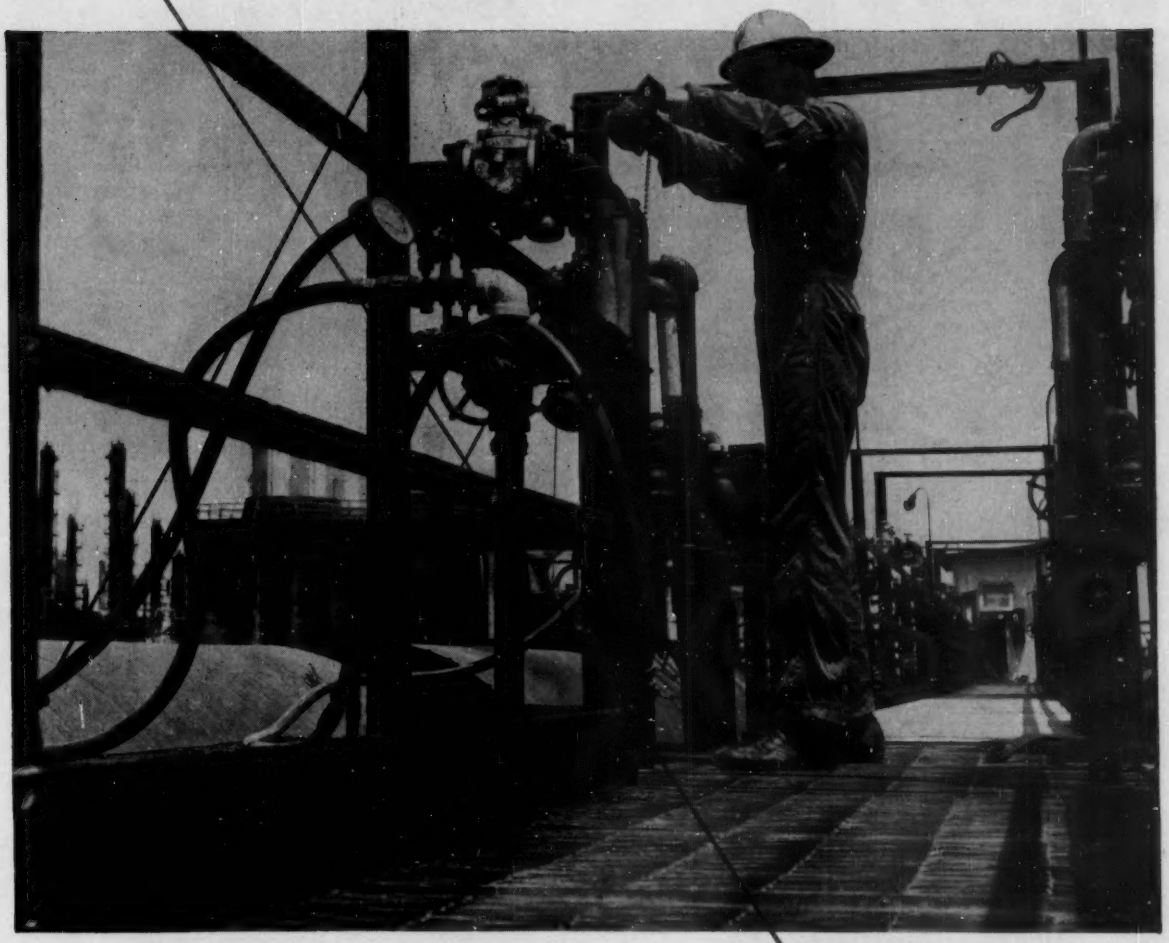
Introduced to European industry just about a year ago, the column was developed by Prof. W. Kuhn, of the Institute of Physical Chemistry, at the University of Basel (Basel, Switzerland). So far, Kuhn has successfully separated heavy water, isomers of xylene and chlorotoluene—but only on laboratory or pilot-plant scale. The big job now is to get the process to work on actual industrial applications.

One of its first commercial jobs may be the production of heavy water. Sulzer is reportedly building a two-stage Kuhn system, designed to turn out about 1.5 tons/year of 99.8% heavy water from a 1.0% feed. The firm has high hopes for the process, feels that one successful installation will go a long way toward stimulating interest among potential takers in this country.

Strong Skepticism: But U.S. processors may be hard to convince. For one thing, they've seen similar systems pile up a 20-year record of failures. One of the best known tries was a column developed by Penn State's Merrill Fenske. A success in laboratory and pilot-plant operations, it ran into crippling scale-up problems, found no takers in industry.

The difficulty of maintaining stable operation in a wetted-wall column belies the simplicity of the Kuhn column's operating principle. Essentially, it's a rectification column in which part of the condensate is returned and brought into intimate countercurrent contact with fresh vapor from the still pot.

yet to be exploited



Butadiene and its derivatives can be the basis of a wide range of better plastics, films, adhesives, elastomers, etc. Soon this unsaturated monomer will be amply available commercially at an attractive price. Many new products that have been researched can now be exploited.

With additional butadiene capacity now being installed, we invite discussion of your future needs and our unique abilities to supply them.

Petro-Tex

PETRO-TEX CHEMICAL CORPORATION
HOUSTON 1, TEXAS

A JOINT ENTERPRISE OF
TENNESSEE GAS TRANSMISSION COMPANY AND FOOD MACHINERY AND CHEMICAL CORPORATION

The large surface area necessary for proper liquid-vapor contact is furnished by a bundle of small-diameter tubes. Optimum number, size and length of tubes is determined by physical characteristics of the product, operating temperature and pressure, and practical design considerations.

The two critical requirements for stable operation are: close control of temperature throughout the length of the column; uniform distribution of the reflux. Failure to provide the latter has led to the downfall of most wetted-wall columns.

But the Kuhn column has an ace up its sleeve—a novel reflux control device possessed by none of its predecessors. It's a dephlegmator that, Sulzer says, is the key to the Kuhn column's efficiency.

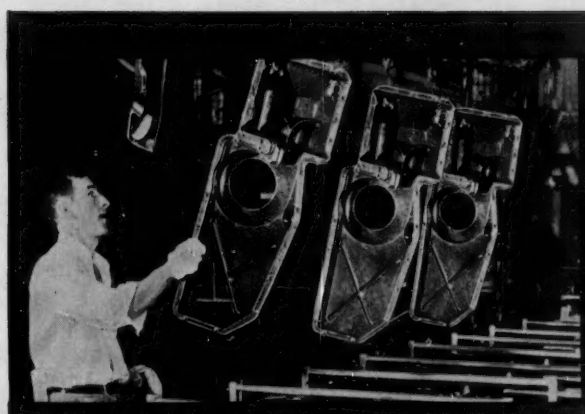
The dephlegmator is a two-chambered cylinder, perched atop the tube bundle of the wetted-wall column. The upper chamber is a receiver for the product vapors that pass through capillaries at the end of the column tubes. Vapors collected in this section flow out of the column to a product condenser.

The lower dephlegmator chamber encloses the upper ends of the column tubes, surrounds them with a liquid that boils at the same temperature as does the product. This liquid determines the column operating temperature and pressure, removes heat of condensation from the lower-boiling component of the vapor that's condensed for reflux.

By close control of the reflux, the dephlegmator strives to solve the problem of liquid distribution—the big fault of all earlier wetted-wall columns.

Other units employed total condensation of the vapors, returned part of the condensate to the tubes for reflux, vapor enrichment. But with this method, it was virtually impossible to distribute the liquid among the tubes so that conditions were identical in each. In the Kuhn column, the lower dephlegmator chamber fixes the reflux rate before the vapors leave the tubes.

Other Answers Needed: Another commercial drawback of all wetted-wall columns—and one that even Kuhn has yet to solve—is their characteristically low throughput. For proper operation, the reflux running down the inner surface of the tubes must be in intimate contact with vapors rising from the still pot. In small diam-



From long pot life in a plastics plant . . .

To dead corn borers in Iowa . . .

By way of an M&C non-metallic mineral

"What's-new Progress Report"—Here's proof that M & C's continuous research and production progress on non-metallic minerals produces a wide range of versatile *opportunity materials* . . . holding many answers to tough problems in end uses that are "miles apart."

Plastics ("Gunk" and Liquid Molding)—Long pot life for the compound being molded is just one contribution of new "tailor-made" M & C fillers. Others are: superior moldability and handling qualities, excellent finish, low cost.

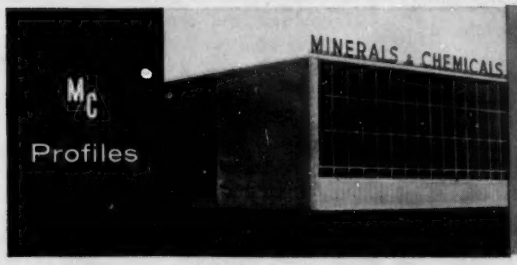
Drying LPG Products Sweet Every Time—A new M & C desiccant—Driocel S—is "built" to overcome souring in the final drying step . . . thorough job, low cost, long life.

Protecting Athletes—M & C sets the pace for safety in sports with ASP Safemark—a newcomer that gives clean, bright, white lines on sports fields . . . and ends forever the risk of burns to athletes.

Hydrophilic or Hydrophobic? Ink and paint makers need inert pigments in both forms. M & C's creative skills meet these needs.

Killing Corn Borers—the new U.S.D.A.-approved granular pesticide way—gets its biggest boost from Granular Attaclay, new carriers M & C developed for the technique.

What Next? That idea of *yours* that needs a *chemically engineered* material? Name the problem, fill out the coupon, and our staff will help you work it out.



We're in the business of *discovery*. Minerals & Chemicals Research Center at Menlo Park, New Jersey houses the central laboratories of M&C, and includes special sections for all of the major fields of endeavor . . . more reasons to

Think of M&C as:

- Important miners and processors of non-metallic minerals
- Leaders in related research and development
- Marketers-Through-Service of a wide line of mineral products to meet industry's needs.

MINERALS & CHEMICALS CORPORATION OF AMERICA
46 ESSEX TURNPIKE
MENLO PARK, NEW JERSEY

M&C's trade-marked products include:

Adsorbents • Aluminum Silicate Pigments • Attapulgite
Activated Bauxite • Catalysts • Fluxstone • Kaolin • Lime Chemicals
Limestone Aggregates • Speedi-Dri Floor Absorbents

MINERALS & CHEMICALS CORPORATION OF AMERICA
46 Essex Turnpike, Menlo Park, N. J.

Please send me:

☐ 16-page bulletin that tells the full M&C story
☐ Samples, information on M&C products for use in

_____

_____

name_____ title_____

company_____

address_____

city_____ zone_____ state_____

eter tubes, vapor-reflux contact is good, but throughput is low. Increasing the tube diameter boosts capacity, but leads to channeling of the liquid and less satisfactory contact.

One possible solution that Sulzer is reported to be studying is the use of packing in the tubes. Raschig rings offset the undesirable effects of increasing tube diameter. But, at the same time, packing adds to the cost of the system, cancels the advantage of low pressure drop provided by unpacked tubes.

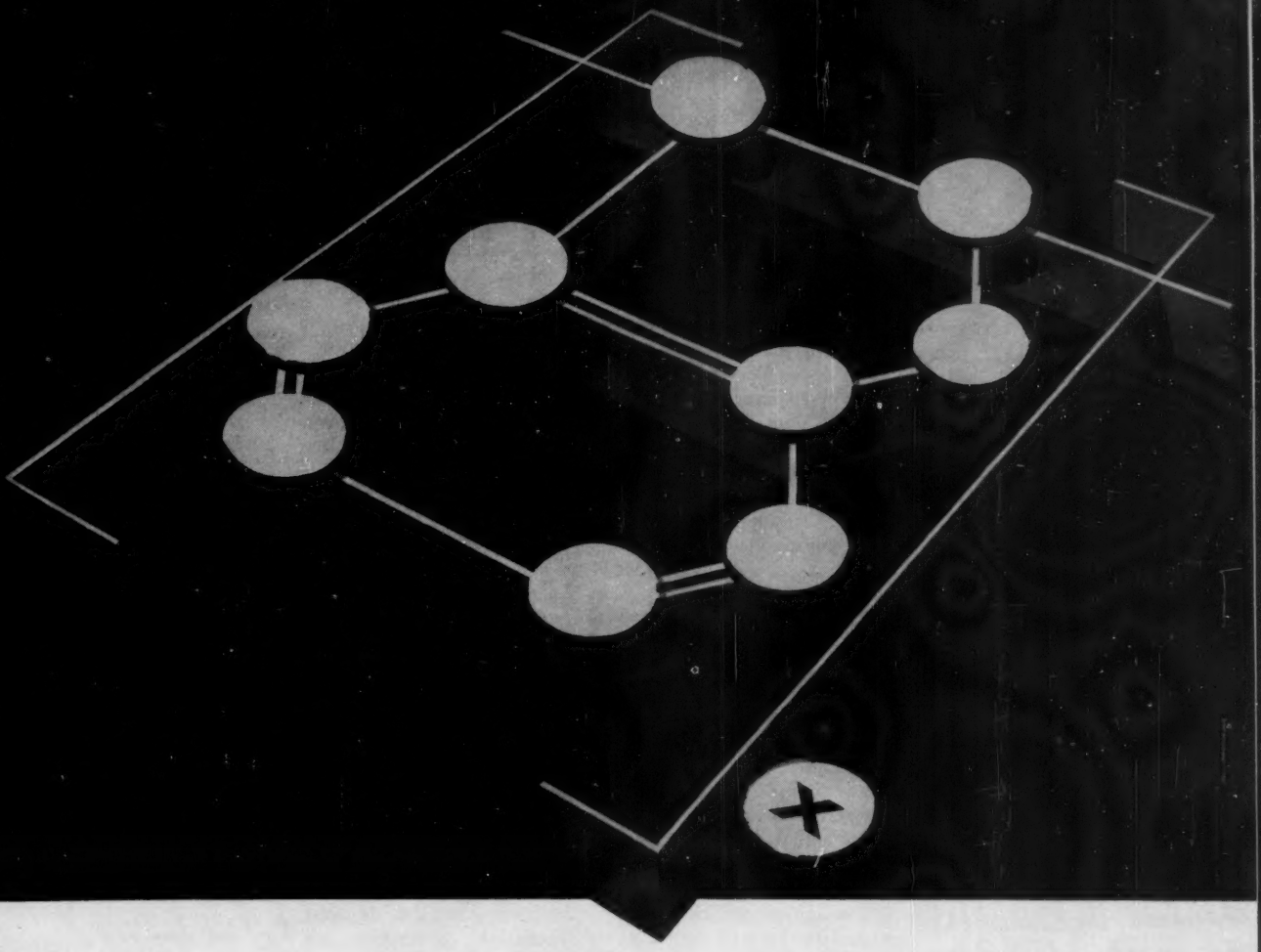
Another alternative—increasing the number of tubes—isn't a simple solution, either. For one thing, larger tube bundles would increase the column diameter, complicate the construction of the column jacket, which provides adiabatic conditions required for uniform operating temperature.

Sulzer frankly states that small- and medium-size units have the best chance of commercial success. But the company's chief objective, for the moment at least, is to break into the industrial field with a workable production-scale unit.

Tailored Design: Several pilot-plant and laboratory models of the Kuhn column are now in operation—one at the University of Basel, another at Germany's Farbwerke Hoechst, and several at Sulzer's own plant. Existing units have been used primarily in design research, to determine optimum tube arrangement needed for desired throughput and economy in specific applications.

Industrial units won't be as versatile as developmental models, may be required to operate in parallel to provide sufficient capacity. A 110-lbs./day heavy-water separation plant, for example, would utilize several 30-ft.-high, 5-ft.-diameter columns for the first stage of concentration (from 3% to about 90% D_2O). Final concentration of the heavy water would be handled by a single column of the same height but slightly smaller diameter.

Most of the experts in this country are watching Sulzer's work with cautious interest. They admit its unique features look good on a small scale, but they've seen too many failures to be impressed by anything less than an actual production installation. If the Kuhn column substantiates its claims, Sulzer will at least have a foot in the door of the U.S. process industry market.



Neville Coumarone-Indene Resins Have Improved Many Products—Yours Could Be One Of Them

In the manufacture of many products from paints to rubber tires and floor tile to chewing gum, Neville resins have long proved their ability to help make better looking, longer wearing, more salable merchandise. Neville produces an extremely wide range of coumarone-indene resins under the most exacting of specifications, and conducts broad and constant research on their mutually profitable use in many types of products. If you have an item which is conceivably applicable, we suggest you send for further information. Without obligation, our chemists will work with yours in developing the application and selecting the proper grade for the job. Use the coupon below.

Neville Chemical Company • Pittsburgh 25, Pa.

Resins—Coumarone-Indene, Heat Reactive, Phenol Modified Coumarone-Indene, Petroleum, Alkylated Phenol • **Oils**—Shingle Stain, Neutral, Plasticizing, Rubber Reclaiming • **Solvents**—2-50 W Hi-Flash, Wire Enamel Thinners.

NEVILLE

Please send further information on Neville Chemicals.

NAME TITLE

COMPANY

ADDRESS

CITY NCI-CW STATE

Now's the Time for Automation Planning

Push-button plants won't spring up in a day if only because the men whose job it will be to build plants of the future can't master overnight the intricacies of the expanding legion of new instruments and automatic process controls. Keeping abreast of this fast-moving technology is shaping up as one of the biggest problems chemical companies will have to solve. Today, they're preparing to meet the common challenge in several different ways.

To make the most of automation, most companies have some plan for coordinating process control—and many are expanding preparations.

Most companies have some provision—anything from a single instrument engineer all the way to elaborately equipped, fully staffed special divisions—to assure efficient utilization of available instruments and control devices. And to take advantage of those that will become available, an increasing number of forward-looking companies are expanding process control programs.

A few companies are sending key people back to school for training in fundamentals.

Among the newer sources of automation know-how are the special courses now offered by engineering schools.

Monsanto, for example, recently assigned three technical employees to take graduate courses as a part of the company's long-range automation program—a special effort by which the company hopes to strengthen its technical foundation.

Cyanamid is setting up automatic control studies at its Stamford, Conn. research labs.

American Cyanamid is also preparing to enlarge its stockpile of automation know-how, will send one man to MIT for a special summer course. Cyanamid is cautiously sounding out the best long-range approach, but is setting up automatic process control studies as a function of its Stamford, Conn., research labs.

The petroleum industry has been preparing for sometime, feels that it is ahead of the chemical industry in the use of automation.

Status Quo: To companies that are already utilizing highly automated processes, long-range planning is not new. Most of them consider additions to their long-range programs as routine.

Du Pont has four groups to coordinate automatic process control, sends men to school for specialized training.

Du Pont, for example, over a period of years, has developed four cooperating groups, which coordinate automatic process control. The applied physics division of engineering research develops new instruments and controls; the mechanical development lab adapts them to process applications; an instrument control group handles problems of design; and a fourth consulting group coordinates activities with outside firms, schools and other agencies.

Petroleum and petrochemical processors are also inclined to take instrumentation and automatic controls pretty much in stride. Most maintain that they are now making maximum utilization of control devices, adding new ones as fast as they become available. Throughout these industries, there appears to be no trend toward emphasizing preparations beyond their present high-level.

Most companies take a wait-and-see attitude, are still not convinced which approach is best for them.

Wait and See: In still another—and by far the largest—category are the many plants that neither have extensive, company-wide automation programs nor are planning them. Some, like International Minerals, are waiting to see how the field develops.

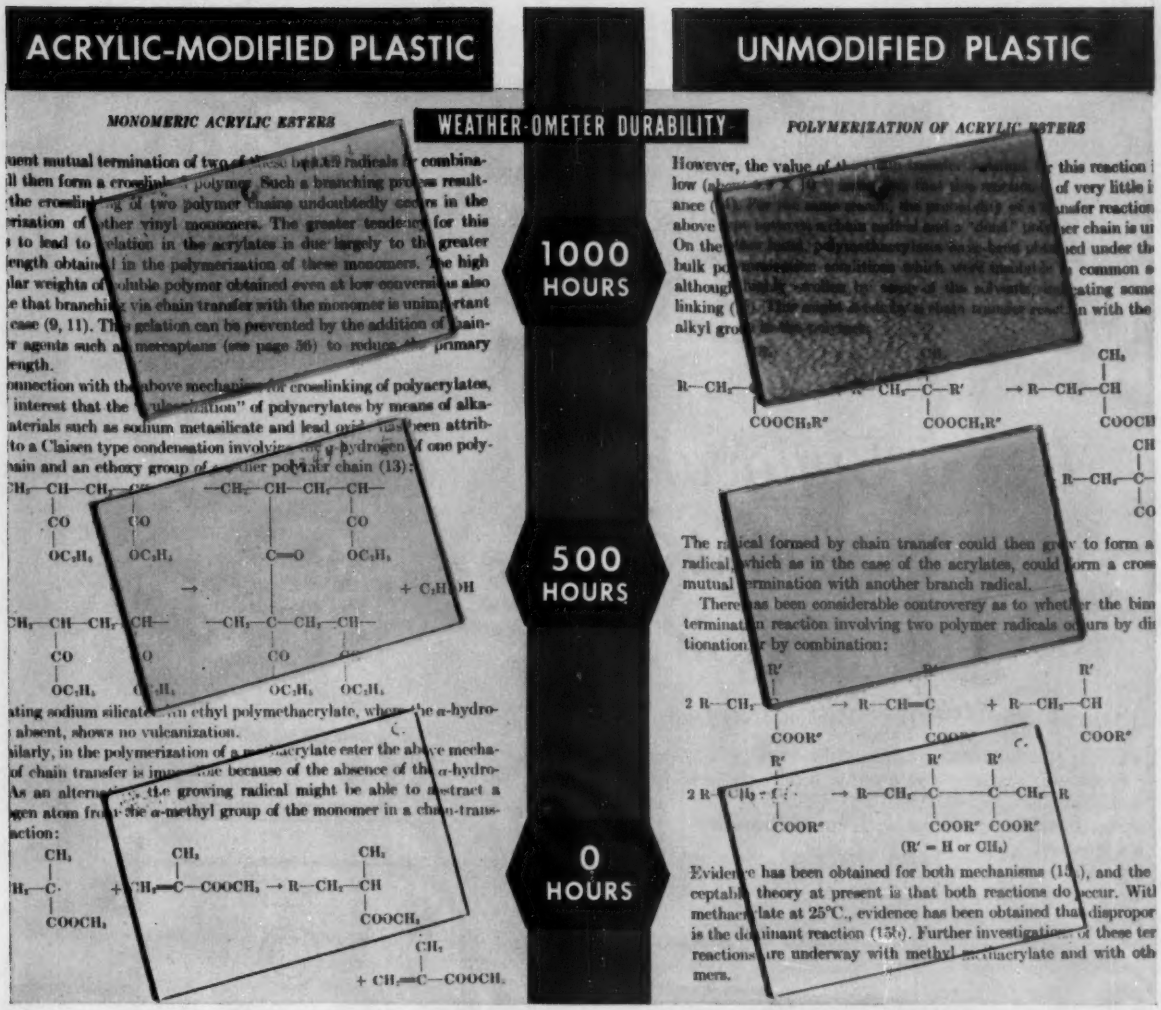
One Texas firm submits automation problems to a committee of specialists.

But, even while they're waiting, many firms are beginning to regroup their automation forces, at least at the planning level. At Diamond Alkali, for instance, process-control problems are coordinated by division operating chiefs and assigned to assistants for special study. Harshaw has a similar system.

One firm in Texas is solving its automation problems by submitting them to a committee of specialists: an industrial engineer, operating personnel, instrument specialists, researchers, mathematicians and electrical and mechanical engineers.

Consensus: start at the top. Policy-level planning is a must—the rest can come later.

Though many companies believe that centralized planning is all they will need for simple problems, most admit that they may have to set up separate automation groups to handle the complex integration of numerous automatic processes. It's this sort of advance thinking that will be an important part of the foundation of tomorrow's push-button plant.



For plastics with built-in old age benefits

. . . copolymerize with Rohm & Haas Acrylic Monomers

A small amount of acrylic monomer makes a world of difference in the performance of a plastic, as the samples above show. Exposed for equal periods in a Weather-Ometer, the performance of the acrylic copolymer against heat and light speaks for itself.

Copolymers can be formed readily with the acrylic monomers and vinyl chloride, vinyl acetate, vinylidene chloride, acrylonitrile or styrene. The primary chemical bonds which are formed mean that the acrylates cannot be extracted by even the strongest solvents, cannot migrate or volatilize; that copolymers remain tough and flexible. How can acrylic monomers make your product better? Our detailed booklet may hold the answer.

ROHM & HAAS ACRYLIC MONOMERS

Methyl acrylate	Ethyl methacrylate
Ethyl acrylate	Hexyl methacrylate
Butyl acrylate	Decyl-octyl methacrylate
2-Ethylhexyl acrylate	Lauryl methacrylate
Methyl methacrylate	Stearyl methacrylate
Butyl methacrylate	Glacial methacrylic acid

Glacial acrylic acid

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

for
a New DENSITY HIGH
in
Concentrating Heat-Sensitive
Liquids

Use a Buflovak
ROTO-VAK
Concentrator

It provides these PROFIT-BUILDING features:

- High concentration of a wide variety of heat-sensitive, viscous and foamy food products and chemicals
- Sterilization combined with concentration
- Increased capacity
- Lower operating cost
- Simplicity of operation
- Ease of cleaning
- Dependable, uniform results, with original qualities of the product retained

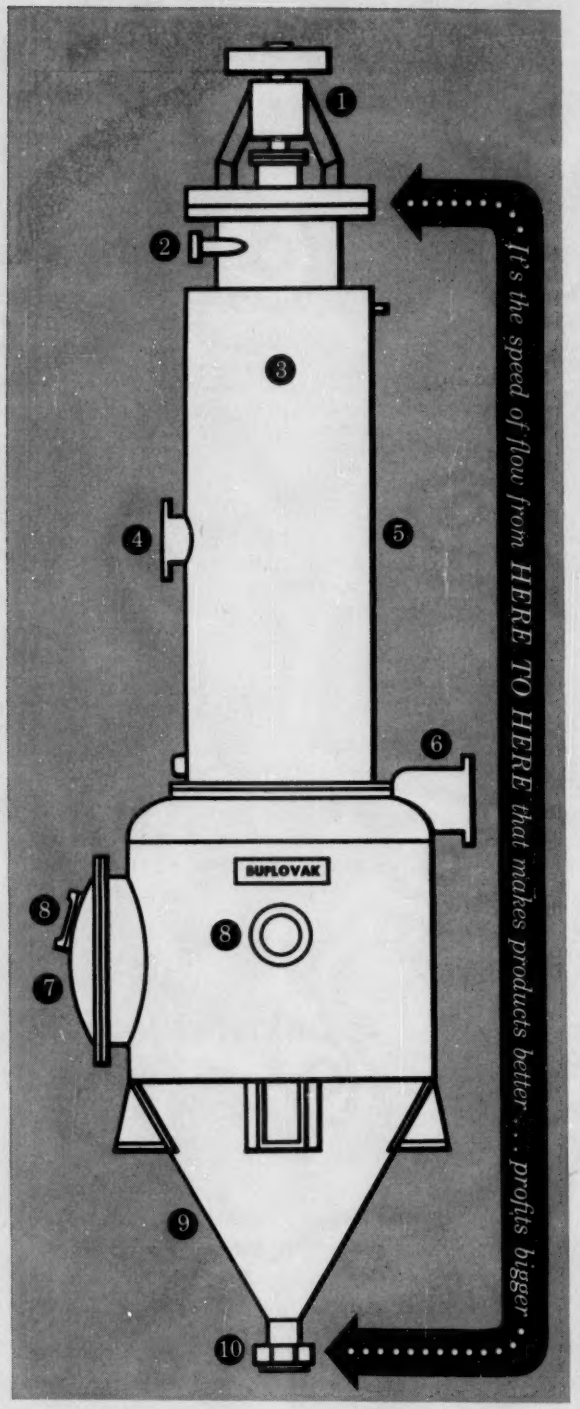
The Buflovak ROTO-VAK Concentrator employs the single pass, downflow principle, plus positive agitation. The combination gives entirely new results, with concentrations of many liquids carried to higher densities than can be satisfactorily accomplished in conventional type evaporators, retaining or improving desirable quality of the concentrated product.

The ROTO-VAK is extremely flexible, operating successfully through a wide temperature range and safely and effectively performing sterilization along with concentration.

We will be glad to test your product on a semi-plant scale with our laboratory model ROTO-VAK Concentrator in the Buflovak Research Laboratory and Testing Plant. Complete information on request.

ASK FOR BULLETIN NO. 369

50th Anniversary
BLAW-KNOX
1906-1956



(1) ROTOR DRIVE (2) PRODUCT INLET (3) INTERNAL VAPORIZATION TUBE (equipped with rotor to increase heat transfer) (4) STEAM INLET (5) EXTERIOR HEATING SECTION (6) VAPOR OUTLET (7) QUICK OPENING DOOR (for easy cleaning) (8) OBSERVATION GLASSES (9) CONE BOTTOM (10) FINISHED PRODUCT OUTLET (no recirculation)

BLAW-KNOX COMPANY

Buflovak Equipment Division, 1593 Fillmore Avenue, Buffalo 11, N. Y.

EQUIPMENT

Indoor Fire Truck: A midget fire truck for fighting fires inside industrial plants has just been developed by Ansul Chemical Co. (Marinette, Wis.). The truck is 5-ft.-8-in. high, can negotiate narrow aisles used by ordinary lift trucks. Designed to use such extinguishing agents as dry chemicals, carbon dioxide and water, the truck provides space for many fire fighting tools.

•

Portable Ammonia Converter: J. C. Carlile Corp. (Denver) offers a new portable ammonia converter that does the job at the tank car, eliminates plant storage of anhydrous ammonia. The unit is mounted on a short, low-boy trailer, permits highway travel between unloading stations. It can convert a tank car of anhydrous ammonia into aqua ammonia in four to seven hours.

•

Automatic Weigh Tank: Now, Davidson-Kennedy Co. (Atlanta) has adapted its automatic weighing tanks to liquid chemical use. Discharge is push-button-controlled; tank is automatically refilled to a preset weight at the end of the discharge cycle.

•

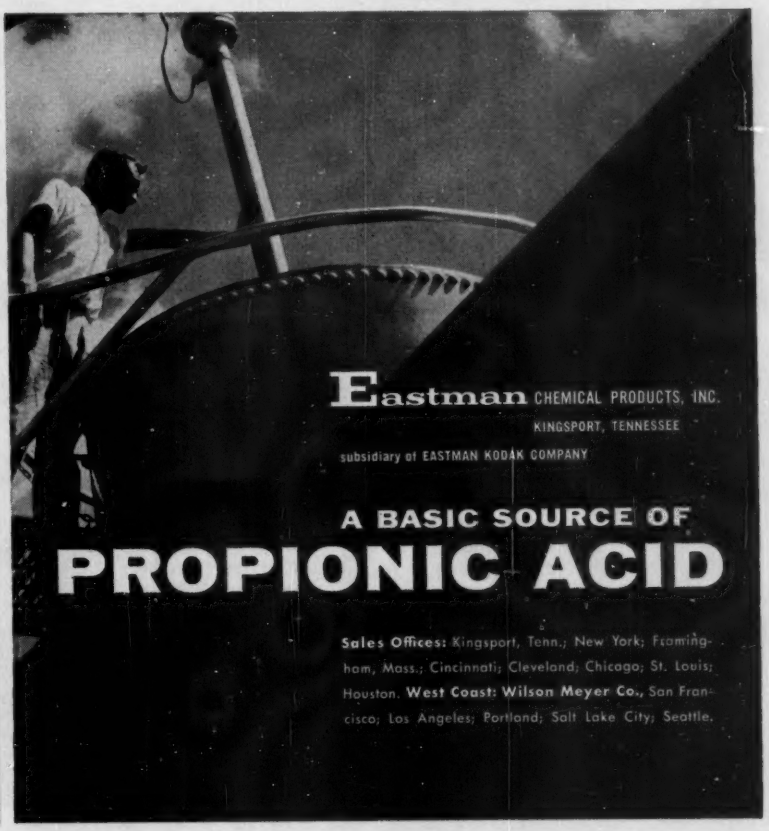
Pressure Transmitter: Conoflow Corp. (Philadelphia) has recently redesigned its pneumatic-pressure transmitter to overcome problems caused when viscous materials harden in bellows convolutions. Tagged Model "P," it has flat diaphragms of rubber, Teflon or stainless steel, instead of bellows. Its pilot is isolated from the pressure diaphragm to prevent backup into air lines if diaphragm fails.

•

Potentiometer-Transmitter: A new Dynamaster Pneumatic Transmitter for measuring variables that can be translated into an electrical quantity is offered by The Bristol Co. (Waterbury, Conn). Available in potentiometer or bridge circuits, it converts measurements such as flow, pressure, temperature, viscosity, pH, resistance, smoke density and conductivity into a 3-15 psi. pneumatic signal for transmission to indicator, recorder or automatic controller. It comes "blind" or with indicating scale for at-the-scene measurement.

•

Corrugated Jacketing: Deep-corru-



gated, aluminum jacketing made by Childers Mfg. Co. (Houston) now may be installed on towers, tanks and other vessels as well as on pipes. A factory-applied moisture barrier of tough paper has been developed to help eliminate jacket corrosion from within, obviate the need for costly felt wrapping on large installations. The jacketing is available with 1¼-in. or 2½-in. corrugations. The aluminum is cross-crimped to add strength.

•

Iron Trap: The new Model LS Sanitary Ferrotrap of Eriez Mfg. Co. (Erie, Pa.) protects against product contamination or machinery damage by fine and tramp iron. Class A handles thin, Class B medium-thick, and Class C viscous fluids, in up to 2-in. lines.

•

Small Acid Pump: Strong acids and other liquids can be pumped from carboys, 55-gal. drums and other containers with Engineered Equipment Co's. (Warsaw, Ind.) new small, bicycle-type pump. Hand-operated, it weighs only 5 lbs., develops pressure to 8 psi.

•

Color Tolerance Computer: Instrument Development Laboratories (Needham Heights, Mass.) is introducing an instrument for use with a colorphotometer to compute deviations from color standard in NBS units. This new electronic Color Tolerance Computer works in the range from 0 to 20 NBS units with an accuracy of 3%.

•

Explosionproof Viscometer: The new Brookfield explosionproof viscometer has been added to the Brookfield Engineering Laboratories, Inc. (Stoughton, Mass.), line for use where Class I, Group D hazards are present. All immersible parts are of stainless steel. The motor is enclosed in a solid, machined-aluminum case.

•

Ceramic Coatings: The Armour Research Foundation has just licensed Continental Coatings Corp. (Chicago) to use its flame ceramics process for application of ceramic coatings to base materials. The coatings are produced by spraying nonmetallic powders through a flame gun onto an unheated surface. A number of coatings, such as stabilized zirconium oxide and aluminum oxide, are available for metals, glass carbon and refractories.

EMPLOYMENT OPPORTUNITIES

IN THE CHEMICAL PROCESSING INDUSTRIES

- **Displayed Rate**—$19.50 per inch. Contract rates on request. Advertising inch measures ⅞ inch vertically on one column. Subject to Agency Commission. 3 columns to a page.
- **Closing Date**—Each Tuesday, 11 days prior to publication date.

- **Undisplayed Rate**—$1.80 a line, minimum 3 lines. To figure advance payment, count 5 average words as a line. 10% discount if full payment made in advance for 4 consecutive insertions. Position wanted ads ½ above rate.
- **Box Numbers** count as one additional line.

Send NEW ADS & INQUIRIES to Classified Adv. Div. of Chemical Week; P.O. Box 12, N.Y. 36, N.Y.

DESIGN ENGINEERS
DESIGN DRAFTSMEN

If you are interested in:
- HIGHEST EARNINGS
- OVERTIME WORK
- PERMANENT EMPLOYMENT
- ADVANCEMENT OPPORTUNITIES
- IDEAL WORKING CONDITIONS
- WELL-LIGHTED, AIR-CONDITIONED OFFICES
- MANY OTHER BENEFITS

Please be sure to contact or see

ARTHUR G. McKEE & CO.

With Engineering Offices in
CLEVELAND, OHIO and
UNION, NEW JERSEY

McKee is a 50-year-old Engineering and Construction firm doing business on a world-wide basis. We have interesting, well-paying positions for

DESIGNERS AND ENGINEERS

qualified in

PIPING	PRESSURE VESSELS
CONCRETE	EQUIPMENT SPECS.
STRUCTURAL	ARCHITECTURAL
ELECTRICAL	MECHANICAL

DESIGN DRAFTSMEN AND DRAFTSMEN

qualified in:

PIPING	STRUCTURAL
CONCRETE	ELECTRICAL
	ARCHITECTURAL

Refinery, Chemical, Blast Furnace, Steel and Sintering Plant, Industrial or Office Building design or drafting experience desirable but not necessary.

The expanding McKee organization, with three engineering divisions, Refinery, Metals and Industrial, offers many interesting opportunities in these highly-paid fields.

Investigate the opportunities McKee can offer you. Please see or contact

EDWARD A. KOLNER

ARTHUR G. McKEE & CO.

2300 Chester Avenue
Cleveland 1, Ohio
TOwer 1-2300

SPECIALTIES OR WAX CHEMIST

Middle Atlantic State manufacturer desires formulating chemist, preferably under forty years of age, with experience in the development of waxes, polishes, chemical specialties, testing on specifications. Paid vacation after 6 months, hospitalization, life insurance, pension plan. Initiative and drive, as well as experience will be determining factors in liberal salary arrangement.

P1920 Chemical Week
330 W. 42 St., New York 36, N. Y.

CHEMICAL ENGINEERS

B.S., M.S., Ph.D., with 0-10 years experience required by progressive medium size chemical company in Western Pennsylvania. Research and Development openings in new challenging field of chemistry

ENGINEERS NEEDED FOR

Process design and development Pilot Plant design and operation Material and economic evaluation

ALL BENEFITS

Life Insurance, hospitalization, vacations, pension plan. Moving expenses paid. Desirable housing available in suburban or rural areas. Investigate these opportunities at once by sending complete résumé to

Personnel Manager,
Callery Chemical Company,
Callery, Pennsylvania.

VINYL POLYMER CHEMIST

To keep up with today's needs and tomorrow's foreseeable demands we are enlarging the scope of our vinyl products. Chemists or chemical engineers with specific experience in polyvinyl acetate polymerization and polymer development are required to carry on the development, manufacture and application of these products. Excellent opportunity to grow with an expanding organization.

Send complete information on education, experience and salary desired. All replies confidential.

Our employees have been informed of this advertisement.

P 1863 Chemical Week
330 W 32 St., New York 36, N.Y.

PETROCHEMICAL MARKETING RESEARCH

Opening for petrochemical or chemical engineer with marketing research or commercial analysis experience. Position is in newly formed marketing research section of a leading national company rapidly expanding in the petrochemical field. Excellent opportunity for future advancement in development, sales, operation, and administrative fields, as well as in marketing research. Location, Houston, Texas. Salary, $7,000-$9,000, depending upon qualifications. Please send personal resume to

P-2002 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

MARKET DEVELOPMENT

Excellent opportunity for aggressive man to join Spencer Chemical Company's expanding market development program, which will permit him to utilize his sales and technical ability.

We are seeking a man who has a chemical or engineering background, and probably three to six years experience. It is desirable that he be familiar with the field of thermoplastics, preferably with thermoplastics molding experience.

Please send detailed resume of personal data, experience, education and present salary to:

Spencer Chemical Company
1004 Baltimore
Kansas City, Missouri

SPENCER

Attention: W. H. Swope, Jr.
Personnel Manager

America's Growing Name
In Chemicals

FLOOR TILE CHEMIST Wanted

Experienced manufacture vinyl tile. Insurance, Hospitalization, and retirement. Replies treated confidentially.

P 1922 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

TECHNICAL SALES REPRESENTATIVE

MUST HAVE SALES EXPERIENCE AND GOOD TECHNICAL BACKGROUND IN ADHESIVES FOR RUBBER BONDING. TO TRAVEL IN NORTHEASTERN UNITED STATES. GOOD OPPORTUNITY WITH PROGRESSIVE, EXPANDING COMPANY.

BOX 369
ERIE, PENNSYLVANIA

Representative Available

CHEMICAL DISTRIBUTING CONCERN

Wanted, HEAVY CHEMICAL lines for basic industry, including raw materials and compounded formulations, detergents, dyestuffs, disinfectants, acids, etc. Have experience & knowledge of No. New England Area. Desire to act as mfg's representative.

RA 1902 CHEMICAL WEEK
330 W. 42 St. New York 36, N.Y.

TILING ENGINEER WANTED

Vinyl Asbestos or Vinyl

Excellent opportunity for man having at least two or three years experience. Liberal Pension & Hospitalization program. Location Midwest.

P 1925 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

(Continued on following page)

MAJOR CHEMICAL COMPANY STARTING PLASTICS DIVISION

Needs 2 Regional Sales Managers and 1 Technical Service Manager.

Regional Sales Managers for New York and Chicago. Technical Service Manager for Los Angeles.

As a new resin producer, we want aggressive, experienced men capable of hiring and training assistants. You will start fresh with a wonderful opportunity for growth in this brand new division.

Write us in detail about your experience and references. All inquiries will be treated confidentially and answered promptly. Interviews can be arranged anywhere. Address

P 1986 Chemical Week
1125 W. 6 St., Los Angeles 17, Calif.

EXECUTIVE

Fast growing, established business, 4 million sales from 3 plants, needs young technical man to learn business and train for No. 2 spot. Good income, security with profit sharing-stock option available. Possibilities unlimited.

Requirements: Organic chemistry background and practical basic business experience, plus willingness to give business "mental homework" and take bad with good in stride.

This is the finest possible opportunity for a man with GENUINE ambition and willingness to accept the challenge.

Location: midwestern city of 50,000 near Chicago.

Submit complete resume to

P 2006 Chemical Week
520 N. Michigan Ave.
Chicago 11, Ill.

CHEMICAL ENGINEERS for APPLIED RESEARCH

Battelle's expanding research program for the chemical industry is creating new career positions for capable chemical engineers in the following fields:

Pilot Plant Operation
Heat Transfer and Thermodynamics
Process Development
Reactor Engineering
Extractive Metallurgy
Minerals Beneficiation
Electrochemical Engineering
Ceramics

These positions offer out-of-the ordinary merit promotional opportunities in a stable, progressive organization which has enjoyed a threefold increase during the past ten years. For technical application form, write to

Technical Personnel Manager
BATTELLE INSTITUTE
505 King Avenue
Columbus 1, Ohio

TRACERS

- USED/SURPLUS EQUIPMENT
- CHEMICALS WANTED/OFFERED
- SPECIAL SERVICES
- BUSINESS OPPORTUNITIES

- **Displayed Rate**—$16.50 per inch. Contract rates on request. Advertising inch measures ⅞ inch vertically on one column, 3 columns to a page. Not subject to Agency Commission.
- **Box Numbers** count as one additional line in undisplayed ads.
- **Undisplayed Rate**—$1.80 a line; minimum, 3 lines. To figure advance payment, count 5 average words as a line. 10% discount of full payment made in advance for 4 consecutive insertions.
- **Closing Date**—Each Tuesday, 11 days prior to publication date.

Send NEW ADS & INQUIRIES to Classified Adv. Div. of Chemical Week; P.O. Box 12, N.Y. 36, N.Y.

EQUIPMENT WANTED

Eastern Chemical Manufacturer requires jacketed stainless steel and glass lined reactors. Also condensers, receivers, filter presses, pumps, vacuum pumps, explosion proof motors, laboratory equipment. State size, condition, price.

W-1978 Chemical Week
P.O. Box 12, Classified Adv. Div., New York 36, N.Y.

FOR SALE
WEED KILLER

2, 4-D Amine Salts 2, 4, 5-T low volatility esters. 15-Fifty gallon drums. $1 per gallon. F.O.B. Jersey City. Subject to prior sale.

HILTON MARWELL & CO.
578 Grove Street Jersey City 2, N.J.
WOrth 4-5167, Journal Square 3-0554

OPPORTUNITIES

business; personal or personnel; financial; equipment; etc., may be offered or located through the classified advertising section of CHEMICAL WEEK. For more information, write to: CLASSIFIED ADVERTISING DIVISION P.O. Box 12 New York 36, New York.

Positions Vacant

Assit. General Plant Superintendent, 5-10 years experience in production operations related to heavy and non-ferrous metals, particularly nickel and cobalt, with a degree in Chemical Engineering or Metallurgy. Unusual opportunity in our Cuban operations, employee benefits, low taxes. Write P-2042, Chemical Week.

Chemists, Chemical Engineers, experienced in Chemistry and Metallurgy related to heavy and non-ferrous metals, particularly nickel and cobalt. Unusual opportunity in our Cuban operations, employee benefits, low taxes. Write P-2038, Chemical Week.

Selling Opportunities Wanted

Established Distributor of Chemicals in Atlanta, Georgia, interested in taking on new Chemical line. We have a large warehouse, can make sales and service accounts in large area. RA-1930, Chemical Week.

Manufacturers' Agent with New York office, Sales Facilities, wishes additional lines to represent, Eastern area. RA-2016, Chemical Week

Pittsburgh Lectrodryer #BA C 50
Alnor Dow Pointer Type 7000 H
Racine Hydraulic Power Unit 130 gal.
Racine Hydraulic Power Unit 50 gal.
Fairbanks Morse, Wesco Condensate Pumps
Peck Stow & Wilcox, Pexto Slitter
Abbe Rotary Cutter No. 0
Flomaster Model KAC (Marco Co.)
Hanson Whitney 4" x 9" Thread Milling Machine
Colonial Vertical Broach Machine Model VBS-4-24

R. P. SCHERER CORP.
9425 Grinnell Ave., Detroit 13, Mich.
Attention: Mr. L. R. Farnum

SURPLUS CHEMICALS WANTED

Chemicals—By-Products—Plasticizers

Pigments — Resins — Solvents

CHEMSOL, INC.
70 Dld Street, Elizabeth, N.J. EL 4-7654

BUYERS OF SURPLUS

CHEMICALS—OILS—SOLVENTS

DRUGS—RESINS—WAXES
PLASTICS—COLOR—ETC.

BARCLAY CHEMICAL COMPANY, INC.
75 Varick Street New York 13, N. Y.
WORTH 4-5120

SURPLUS BOUGHT

ODD LOTS—DISCONTINUED RAW MATERIALS —SPENT OR CONTAMINATED SOLVENTS RESIDUES — METAL SLUDGES — OBSOLETE PLANT INVENTORIES

Industrial By-Products Surplus Co.
DIV. OF ACETO CHEMICAL CO., INC.
40-40C Lawrence St., Flushing 54, N. Y.
INdependence 1-4188

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS PLASTICIZERS. RESINS. DYES SOLVENTS, PIGMENTS. ETC.

CHEMICAL SERVICE CORPORATION
96-02 Beaver Street, New York 5, N. Y.
HAnover 2-6970

For Sale

J. H. Day Stainless Steel Sigma Blade double arm jacketed mixer, 75 gal. work. cap. Perry, 1415 N. 6th St., Phila. 22, Pa.

Niagara Type 316 Stainless Steel Filter, model 510-28, 510 sq. ft. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

Waste Disposal Plant including Oliver Precoat filter 5' 3" dia. x 8' face with Nash Hytor Vacuum Pump, 18' dia. lead lined steel reacting tank, piping, pumps, agitators, etc. Built 1951—Unused. Perry, 1415 N. 6th St., Phila. 22, Pa.

For Sale

De Vilbiss foam spray equipment gun, heater, pump, pressure valve, flowmeter and hose—Used. The R-W Mfg. Co., Box 590 24 Brown St., Barberton, Ohio. Plaza 3-8415—W. R. Lawton.

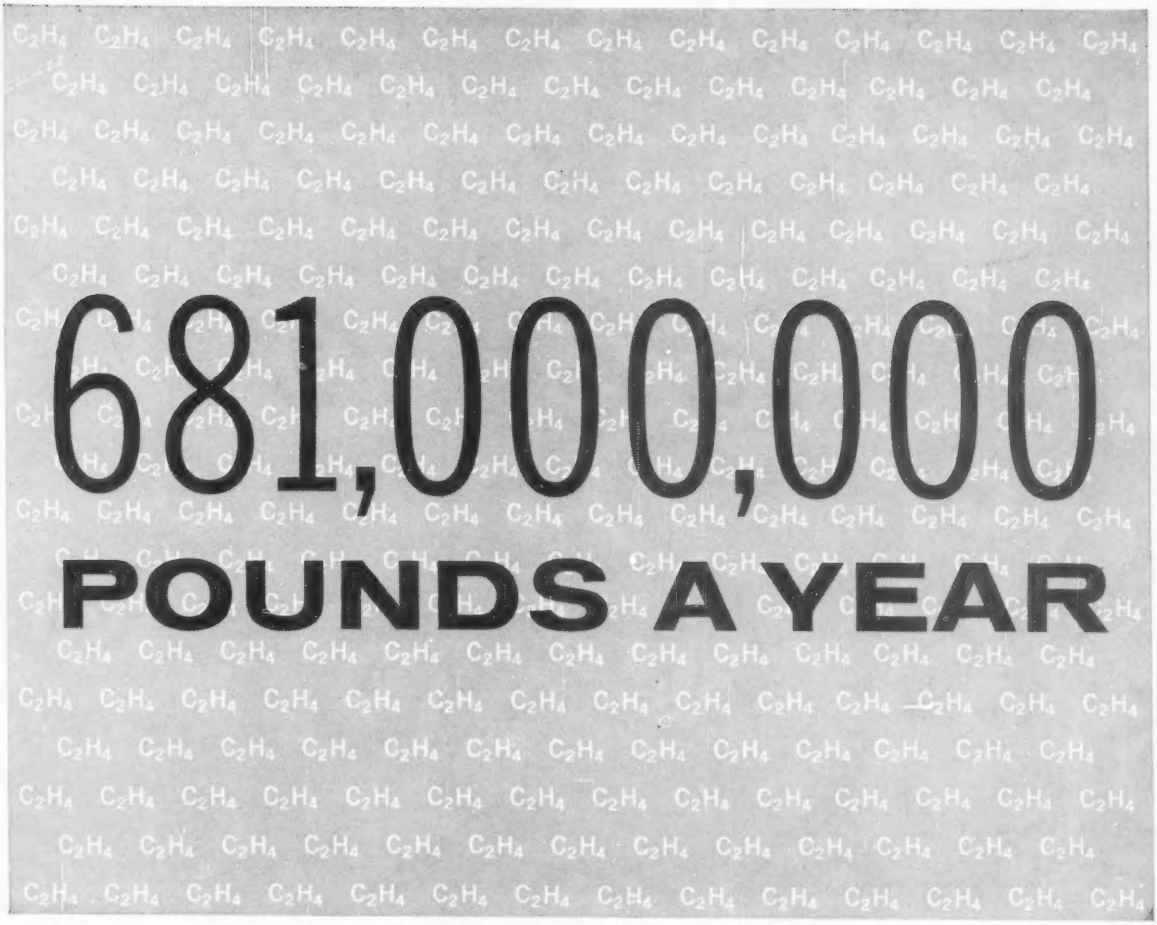
CHEMICAL WEEK • ADVERTISERS INDEX

June 16, 1956

tracers SECTION
(Classified Advertising)
F. J. Eberle, Business Mgr.

ADVERTISING STAFF

Atlanta 3 ..... William Kearns 801 Rhodes-Haverty Bldg., Walnut 5778-2383
Boston 16 ..... 350 Park Square Building Hubbard 2-7160
Chicago 11 ..... Alfred D. Becker, Jr., Francis E. Stewart, 520 N. Michigan Ave., Mohawk 4-5800
Cleveland 15 ..... Vaughn K. Dissette, 1510 Hanna Bldg., Superior 1-7000
Dallas 2 ..... Gordon L. Jones, Adolphus Tower Bldg., Main & Ackard Sts., Prospect 7-5064
Detroit 26 ..... 856 Penobscot Bldg., Woodward 2-1793
London ... H. Lagler, McGraw-Hill House, 95 Farrington St., E.C. 4, England
Los Angeles 17 ..... Peter Carberry, 1125 West Sixth St., Madison 6-9351
New York 36 ..... Knox Armstrong P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 330 West 42 St. LOngacre 4-3000
Philadelphia 3 ..... William B. Hannum, Jr. Architects Bldg., 17th & Sansom Sts., Rittenhouse 6-0670
Pittsburgh 22 ..... 919 Oliver Bldg. Atlantic 1-4707
San Francisco 4 ..... William C. Woolston, 68 Post St., Douglas 2-4600
St. Louis 8 ..... 3615 Olive St., Continental Bldg., Jefferson 5-4867



...ENGINEERED BY KELLOGG

Annual capacity of ethylene manufacturing or recovery plants completed or under construction by The M. W. Kellogg Company and subsidiaries—in the United States, Great Britain, Italy—will add up to 681 million pounds! If *you* are thinking of new or expanded facilities to meet predicted demands for ethylene, consider this Kellogg experience—especially as it concerns the economics of obtaining high yields with exceptionally high purity.

M. W. Kellogg is prepared to engineer and build plants now to meet any future situation in the manufacture of ethylene or recovery from refinery streams, and to guarantee optimum returns. With Kellogg's steam-pyrolysis process, manufacturing plants can be designed for the continuous production of over 99% purity ethylene from a variety of feedstocks, including ethane, propane, naphtha, natural gas, casinghead or natural gasoline, gas oil, even reduced crude. In ethylene recovery from various petroleum processes, Kellogg engineering means low initial investment and low operating costs.

For detailed information, write for 8-page booklet. Interested firms are also invited to review, with M. W. Kellogg process engineers, the cost data Kellogg has accumulated on ethylene manufacturing in pilot plant and commercial production.

M KELLOGG W

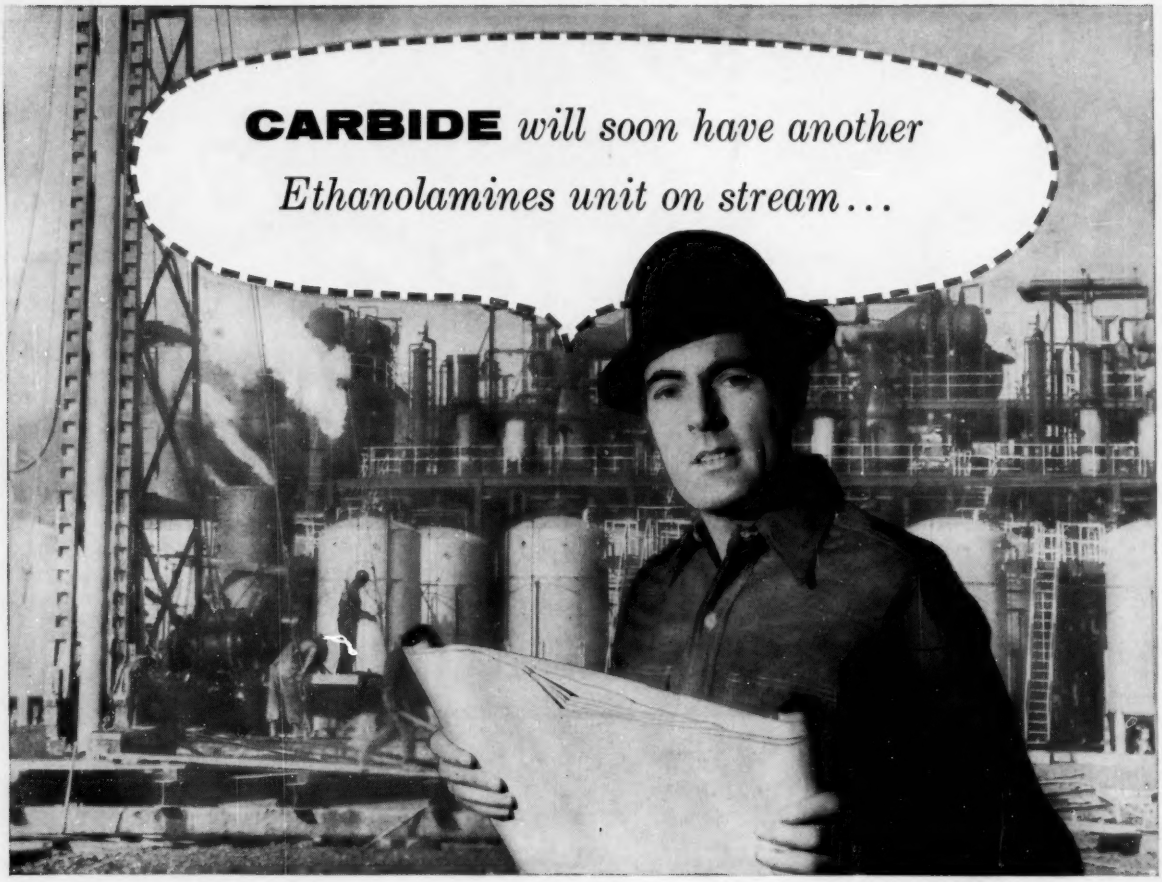
PETROCHEMICAL PROCESSES AND PLANTS

CHEMICAL PROCESS DIVISION

THE M. W. KELLOGG COMPANY, 711 THIRD AVENUE, NEW YORK 17, N. Y.

A SUBSIDIARY OF PULLMAN INCORPORATED

The Canadian Kellogg Company Limited, Toronto • Kellogg International Corporation, London • Societe Kellogg, Paris
Kellogg Pan American Corporation, New York • Companhia Kellogg Brasileira, Rio de Janeiro • Compania Kellogg de Venezuela, Caracas



here's how you'll benefit...

CARBIDE'S Seadrift, Texas plant will soon be pouring out ethanolamines to meet growing needs for acid gas absorbents and vital components of soluble oils, detergents, and soaps. This means that there will be two plants—South Charleston, West Virginia and Seadrift—supplying you with ethanolamines.

You can share in this increased availability by checking with your CARBIDE Technical Representative now.

Here are at least three ways you can benefit by choosing CARBIDE'S ethanolamines today:

- You receive immediate delivery of mono-, di-, or triethanolamine—in the size shipment you need from the CARBIDE warehouse in your area.
- You profit through complete technical help from the world's first—and leading—producer of ethanolamines.
- You don't have to worry about continuous supply—especially with CARBIDE'S plants drawing on a constant source of raw materials.

Write today for your copy of the booklet "Nitrogen Compounds," which discusses applications, physical properties, and specifications for CARBIDE'S ethanolamines. Address—Carbide and Carbon Chemicals Company, Room 308, Dept. H, 30 East 42nd Street, New York 17, New York.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

CARBIDE
AND CARBON
CHEMICALS

Carbide and Carbon Chemicals Company
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.